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NO. 1 1943

AMERICAN GAS JOURNAL

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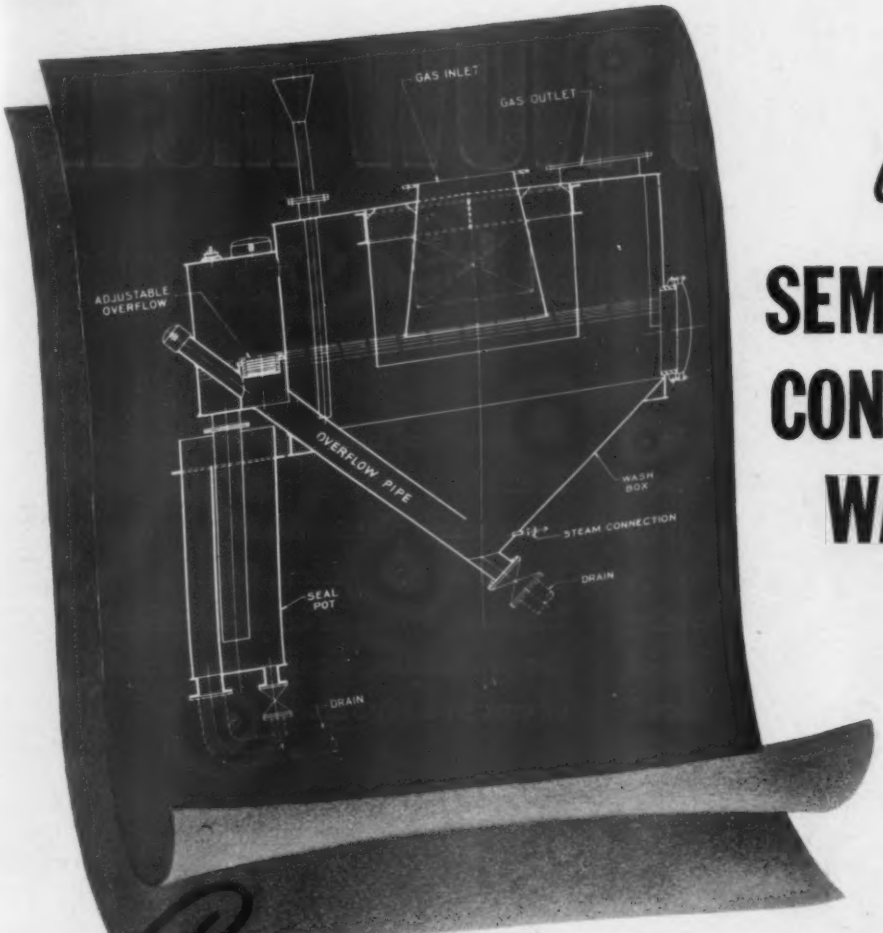

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* * *

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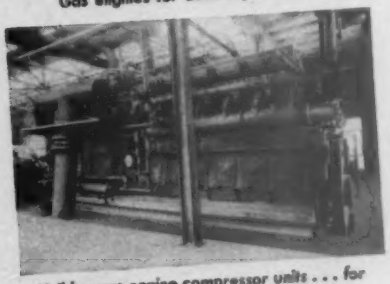

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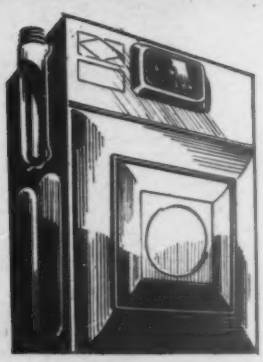

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JULY
1943

AMERICAN
GAS JOURNAL

VOLUME 159
NO. 1

The Need Of Post-War Planning

THE AMOUNT of material that one sees on the subject of Post-War Planning is so great that it sometimes seems overwhelming and confusing. On the other hand, failure to study this subject is apt to find us in the post-war period in an unprepared condition similar to our unpreparedness for war at the beginning of the war. When the war ends, a critical period will be ushered in that will be just as vital to the welfare of the future, as is the winning of the war, because without proper planning, chaos and confusion can result at the cessation of hostilities which can be nearly as devastating in its effect, if not more so, than might have been the loss of the war. It is realization of these points which has caused so many to give consideration to the matter of post-war planning and which has precipitated the confusion that sometimes seems evident.

A. M. Beebee

On the other hand, there is a great deal of data that should be intelligently analyzed, in order to make possible some reasonable planning in the future.

The Post-War Planning Committee of the American Gas Association started with the following fundamental premises:

1) By having a small group (such as our Committee) studying all these related factors, the great majority of the industry can feel free to bend their efforts in the direction of winning the war, since they will know that the matter of post-war planning is not being neglected.

2) The Post-War Planning Committee, after carefully surveying the situation, quickly came to the conclusion that post-war planning, unless carefully formulated, is apt to involve such a wide field as to be very confusing. We must not spread our efforts so thin as to be of no value. We therefore concentrated our efforts on four basic fundamentals, as follows:

(a) Post-War purchasing power and potential markets.—C. V. Sorenson, Chairman.

(b) Competitive factors that will seek the realization of the potential market. —R. J. Rutherford and R. E. Ginna, Chairmen.

(c) The factors which will enable our industry to achieve the potential markets.—Hall Henry, Chairman.

(d) The effect of national planning and trends.—Walter C. Beckjord, Chairman.

It was our thought that after these four basic studies have been rather thoroughly covered, they can be the foundation stones on which to build post-war planning, both from an industry-wide point of view, as well as from the point of view of the individual company.

3) The Committee quickly came to the conclusion that no Association activity can do all the post-war planning for all the companies. There is, however, a very definite service that combined post-war planning can perform for the industry. In other words, we feel that there are some basic fundamentals facing the industry on which all the companies will need information, in order to enable the various companies to intelligently plan their own post-war activity.

☆ ☆ ☆ ☆

The above program has received enthusiastic support which has been most encouraging, and our Post-War Planning Committee will soon be in a position to submit the results of some of its findings.

There are, however, immediate conclusions that to the Committee have become self-evident, which have been covered by appropriate activity. The more important ones are as follows:

(a) At the present time, it is most vital that the National Advertising program be enlarged and broadened, so as to help enable our customers to better face the problems involved in the prosecution of the war, as well as to enable the industry to enter the post-war period in a position to render the maximum service possible to the communities we are trying to serve.

(b) We should do all that we can in the meantime to formulate and develop a program of research, so as to enable us to offer greatly improved appliances and character of service in the post-war period. Our Committee will have a great deal more on this latter subject as time goes on.

☆ ☆ ☆ ☆

I think from the above you can readily see that post-war planning can be a very definite service to the industry and to the society we are trying to serve, and it is the hope that our Committee activity will be useful in that direction.

A. M. Beebee

Chairman, Post-War Planning Committee, American Gas Assn.

Recent Production Improvements in Magnesium Melting and Aluminum Ladle Preheating Through Direct Radiant Gas Firing

By

James Kniveton

Manager, Furnace Division
The Selas Company
Philadelphia, Pa.

WHEN the historians of the future chronicle the technological progress now being made in this era of national strife, they will find that World War II has begotten an amazing number of new manufacturing materials, improved manufacturing processes, and more efficient production techniques. Some of our greatest industrial achievements are traceable to the stimulus of World War I.

During the present war equally radical advances are being made all about us. And it is important for us to discern them as early as possible —especially, in so far as we here are concerned, within the realm of the foundry industries.

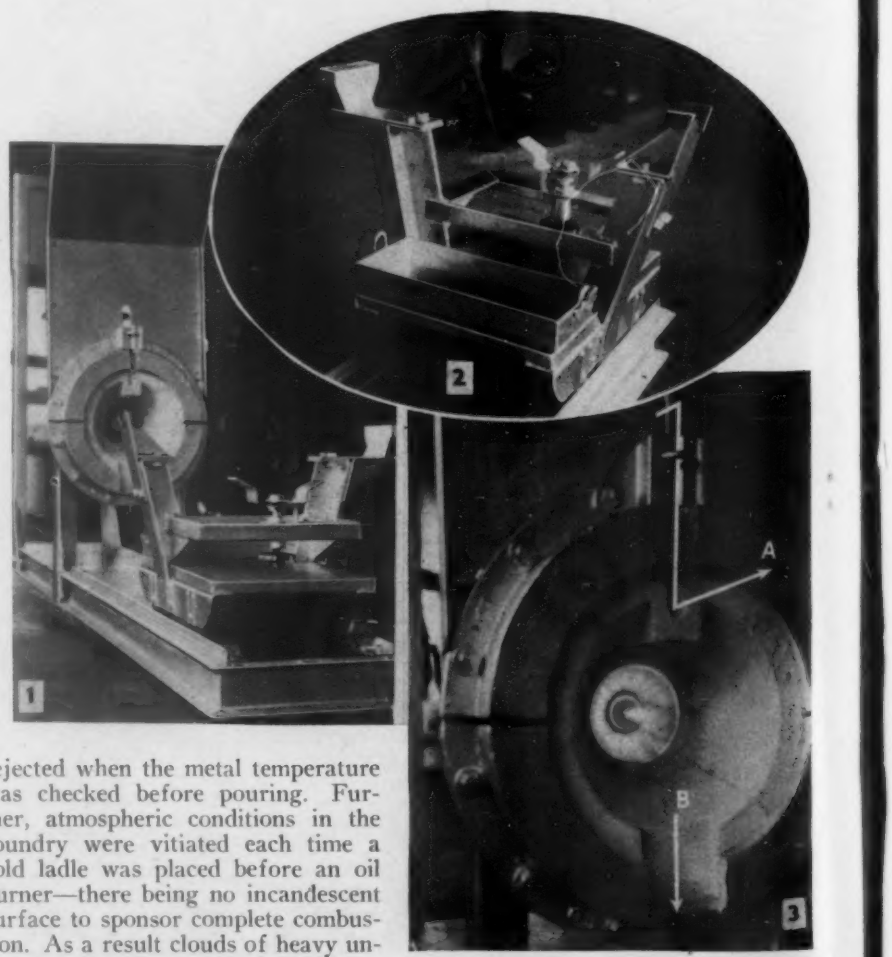
From the standpoint of heat manipulation, three significant new foundry processes come immediately to mind. I refer specifically to recent accomplishments in the fields of (1) heat treated cast steel, (2) aluminum pouring - ladle preheating, and (3) magnesium pig and crown melting. The present paper, being confined to the non-ferrous, covers only the latter two subjects. We shall not discuss the metallurgy of aluminum or magnesium melting, but shall deal solely with the development, the usefulness and the application of two new heating devices which have made it possible to meet more exacting specifications and sponsor more perfect continuity of operation in casting these two now-famous light metals.

More Uniform Aluminum Castings Through More Uniform and Controllable Ladle Preheating

Success in pouring intricately shaped aluminum castings depends upon the metal being poured into the molds at both correct and uniform temperatures—and, in order to minimize disturbing temperature effects between melting furnace and mold, it is necessary uniformly to preheat the ladles in which the metal is conveyed.

Prior to the development of the gas-fired radiant ladle preheater, oil-fired equipment was generally used, consisting of an oil burner projecting long flames directly at the bottom of the ladle. As a result of such crude heat application, the ladle bottom was unavoidably overheated while the top edges and the pouring lip were underheated. Also, the preheat temperature developed in the ladle (or crucible, in the case of insulated ladles) was wholly up to the judgment of the operator, and many charges had to be rejected when the metal temperature was checked before pouring. Further, atmospheric conditions in the foundry were vitiated each time a cold ladle was placed before an oil burner—there being no incandescent surface to sponsor complete combustion. As a result clouds of heavy unburned oil smoke (associated with annoying noise) were generated until ladle preheating was well advanced. Finally, one important engine-head founder has reported undue difficulty in removing oxides, slags and foreign matter after oil preheating — with consequent damage to crucibles as a result of gouging and flaking.

To surmount these shortcomings of conventional preheating practice, five major plants have cooperated with the author's company to develop a gas-fired unit utilizing controlled and directed radiant heat energy in an automatic apparatus especially adapted to foundry circumstances. To date no less than 53 such units are in regular operation. There are slight variations between different models to accommodate varying pro-



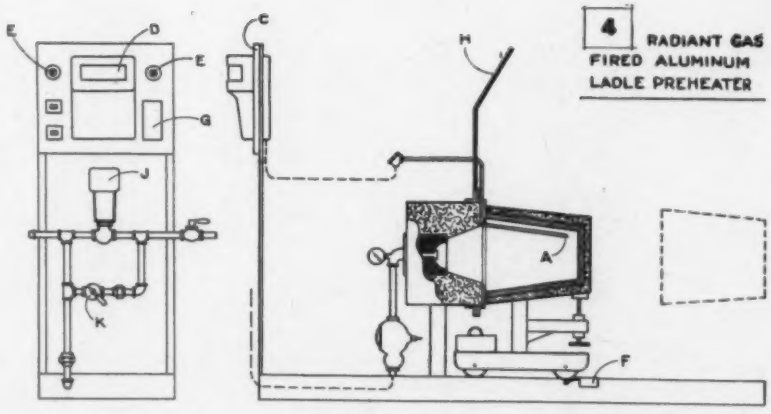
duction schedules and ladle types. But, substantially, all follow the pattern of the unit shown in Figs. 1, 2 and 3.

Premixed gas and air (precisely carbureted and delivered at a non-varying high burner pressure) is supplied to the special ceramic-cup heat-radiating assembly. This particular unit consists essentially of an adjustable carriage-mounted cradle on which the ladle is placed in a horizontal position and moved forward to the radiant heat source.

As shown in Fig. 2, the cradle design permits handwheel adjustment for various ladle sizes, as well as close adjustment of the ladle axis to permit a good flush fit of the ladle rim against the butt ring at the edge of the radiating combustion chamber. The notched block opposite the "V" in which the "near" ladle trunnion rests allows a selection of many positions for the "opposite" or "far" trunnion—thus adjusting the position of the plane of the ladle top.

Fig. 3 shows, in throttled operation, the all-ceramic cupped radiant heat source, and its refractory projection to the butt ring against which the ladle rim seats. This unit is capable of high rates of heat liberation under very precise control, yet directs that heat in a soft divergent beam toward the sidewalls of the ladle. It will be recognized by those familiar with combustion that the straight-through nozzle-type of burner has a high flame temperature near the end of its torch which cannot avoid overheating the bottom at the expense of the rim. The radiant burner, on the other hand, acts in the opposite manner—to favor the sidewalls of the ladle (because each of the 32 component flames which scrub the incandescent cup are directed at right angles to the axis of firing). To balance the bottom and sidewall heating effects, therefore, a few carefully proportioned straight-through ports are located in the center of the flame-distributing tip — to direct a regulated fraction of the total burner output directly at the bottom of the ladle. Thus, the same rate of temperature rise at all points over the interior ladle surface can be assured.

Units of this type are being used both on insulated crucible-ladles (No. 80 crucibles), and on simple non-insulated ladles. One user in the former category reports, "uniform heating out to the pouring lip, to a temperature of 1450°, within a time interval of 15 minutes." Another user in the latter category achieves uniform final temperatures in 3 to 4 minutes. One founder reports "crucible life increased 100%—both as a result of improved temperature uniformity and a greater facility in removing oxides and slags." On an average, each heater consumes fuel at a rate of 150,000 Btu per hour when in full operation, throttled pilot consumptions (between ladle-heating cycles) being only 70,000 Btu per hour. Smoke and fume are completely eliminated—and noise is much reduced over the rapid-fire "popping" familiar to users of oil-fired preheaters.



4 RADIANT GAS FIRED ALUMINUM LADLE PREHEATER

Temperature control, to prevent overheating of the ladle, is accomplished by means of a thermocouple protruding into the interior of the ladle so that the junction is located near the bottom and adjacent to the sidewall.

In Fig. 4 the thermocouple position is also shown. The control panel itself is located at C, well behind a heat baffle, H. On this panel is mounted an indicating temperature control instrument, D, and, if desired, signal lights, E, one of which indicates that the equipment is in operation while the other can be connected through the controller to indicate completion of the preheating cycle. In some cases a limit switch, F, is provided automatically to begin the preheating cycle when the ladle is moved forward into contact with the butt ring of the burner assembly. In one case this limit switch also actuates a locking device which is not released until correct preheating temperatures are attained, thereby preventing over-eager operators from, removing ladles too quickly and risking lost castings or lost time. The length of the firing cycle may be either automatically regulated by a timer, G, set in motion when the limit switch, F, is actuated, or may be indefinite. When the heating cycle is indefinite, the temperature controller will automatically maintain the set preheat temperature by alternate openings and closings of the solenoid valve, J, until the ladle is manually removed. K is the bypass valve for throttled-input adjustment. Upon removal of the ladle the burner will automatically throttle (if it is not already throttled) through the opening of limit switch, F, and will remain in this throttled position until another ladle is brought up into the firing position.

Obviously, the degree of automatic control utilized will be fixed by the user's requirements and the additional expense involved.

It is apparent that in straight-line mass production the saving in labor, the reduction in preheat time, the increase in percentage of acceptable melts, and the decrease in numbers of rejected castings, will quickly pay for installation of the gas-fired radiant type of preheater. In intermittent job foundry practice the not inconsiderable cost of such units plus the cost of carbureting machinery essential to their correct operation, will have to be carefully weighed.

Better Magnesium Melts and Longer Pot Life Through Direct Radiant Heat

Another field of benefit in nonferrous foundry practice through the uniformity and controllability of direct radiant gas heating, is in the melting of magnesium pigs and crowns and in the melting of the flux used in connection therewith.

Fig. 5 shows a 2000-pound pot furnace fired with 18 all-ceramic radiant burners in two rows. This furnace is designed for a ladling rate of 600 pounds per hour and an operating temperature of 1350° F. It is worth noting why so many heat sources are distributed around a pot only 3 ft. 4 in. in diameter, and why most of these burners surround the pot near the top. Applying the greatest proportion of heat directly to the top of

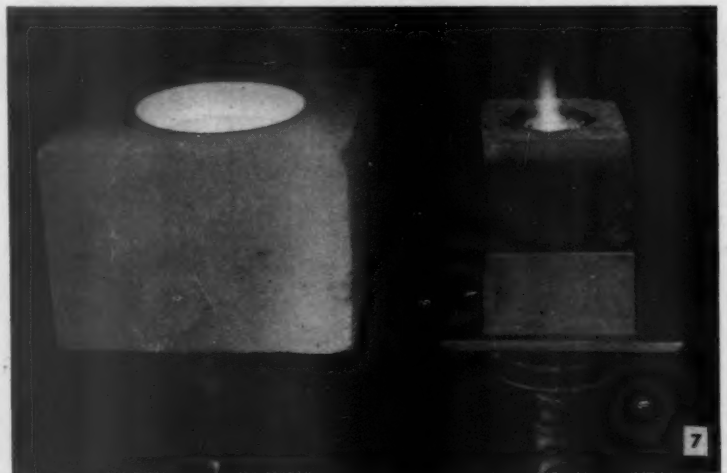
the pot compensates for heat losses arising from the exposed pot rim and molten metal surface. Conventional methods of firing employ one to four nozzle-type burners tangentially arranged at lower levels in the furnace sidewalls (these lower levels being necessary in order to avoid localized overheating in the vicinity of each burner). As a result most of the heat is, incorrectly, applied near the bottom of the pot. The use of such a multiplicity of radiant burners (18 in the illustrated design), each independently adjustable for relative consumption, permits manipulation of heat input distributions over the pot surface to compensate for any other localized losses such as clean-out door openings, vents, etc.

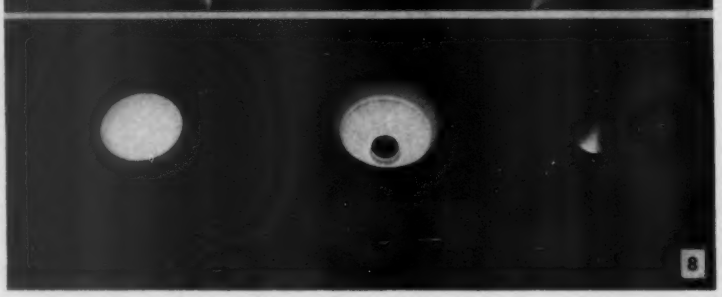
Fig. 6 is a view down into this same furnace with the pot removed, and gives a head-on look at 7 of the 18 radiant cups. It is significant to note that combustion is entirely confined within the cup concavity and that no flame whatsoever is projected toward the pot walls. This is important in terms of pot life and the elimination of "hot-spot" heating. The pot is, in effect, immersed in a uniform blast-free bath of intense radiation.

Fig. 7 is dramatic proof of this effect. In this photograph both the radiant burner and the conventional burner are operating at the same rate of consumption. The elimination of "torching" is apparent with the radiant burner at the left. Also, observe the uniformity of incandescence within the radiant cup. In this connection it is important that burners be properly sized. In Fig. 8, two radiant burners are shown in operation at the same rate utilized in the conventional burner at the extreme right. Obviously, the central burner is over-sized, and the non-uniform cup radiation is confined to the base of the concavity. The burner at the left is properly sized for the input being tested and shows effective, intense, and homogeneous radiation.

Fig. 9 shows a smaller magnesium melting pot of the same general type, and is interesting because it is used for flux as well as for magnesium metal. In two major plants just placed in operation within the last two months, one such setting, used for flux, services two of the larger melting units to constitute one production battery. One user already employs four such batteries.

The method of control of direct gas-fired radiant type magnesium pots demonstrates their remarkable heating uniformity. Two thermocouples are employed, one immersed in the metal and the other located between the radiant heat-generating surface and the pot. The latter thermocouple is set for a higher temperature than the thermocouple in the metal, establishing a predetermined maximum allowable temperature gradient between the combustion chamber and the hot metal, for the purpose of fast heat transfer without overheating. The design of the temperature control instrument to which these thermocouples are connected is such that once the maximum temperature gradient is estab-

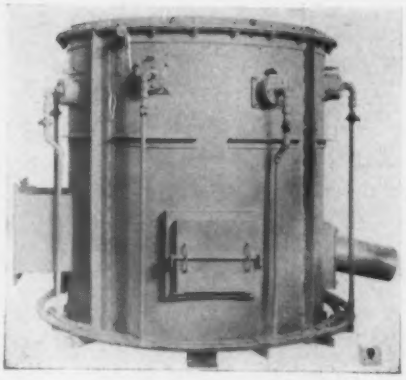




lished across the pot walls, control is automatically switched to the thermocouple located in the metal where it remains until further cold crowns or pigs are charged.

You who are familiar with conventional pot firing can appreciate how difficult, if not impossible, it would be thus to regulate temperature gradients with one thermocouple located directly in the path of swirling flame. Up until the development of the ceramic-cup radiant gas burner such control was practicable only with indirect firing.

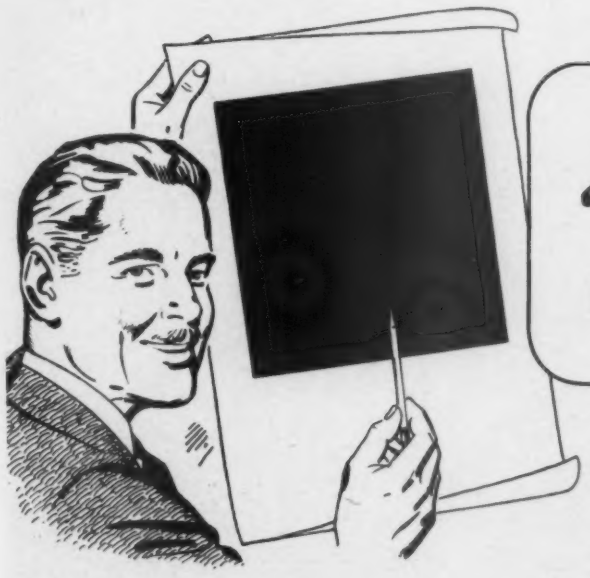
You may be interested in such features as: (1) large clean-out doors with quick-acting wedge-bar latches; (2) an emergency metal run-out spout which is refractory lined; (3) two 2-inch fire-extinguisher openings through the cast iron top ring; (4) capped burner view holes which permit inspection of the incandescent radiant cups during operation; (5) the bottom vent; (6) the floor line (established by the horizontal angle sections) which locates the pot top at a convenient working level; and (7) hard burned refractory lining (to resist molten magnesium in case of pot failure), used in addition to the insulating refractory lining on the furnace floor and half way up the furnace sidewalls.



So much for the technical fine point. In magnesium foundry practice this new approach to melting problems can mean a degree of controllability and heating uniformity higher than heretofore achieved. The benefits of this greater controllability and uniformity extend beyond the quality of the cast product—also to embrace such factors as greater safety in a hazardous operation, conservation of metal, and longer pot life.

In closing we want to emphasize that direct radiant gas firing opens horizons in foundry practice far wider than suggested by the two specific applications to aluminum ladle preheating and magnesium crown melting which you have asked us to discuss. We assume that most of you know of the tremendous strides being made in the heat treatment of alloy steel castings—to convert them from "just castings" into yet-unmatched armor. We cannot resist closing emphasis on the fact that direct radiant gas combustion of precisely the type we have here discussed has been the determining factor in the heat treatment of cast armor for military tanks since the very first "baby" pilot installation three years ago. Suffice it to say that, today, no less than 15 giant furnaces (up to 325 ft. long, some enclosing as many as 12 independently-motored 26-foot cars at once) utilize over 4,000 radiant gas burners within a very short distance from this meeting room. In some of these furnaces high temperatures must be maintained throughout 10-ton castings within tolerances of $\pm 9°$ at every point. That is a specification not easy to meet.

From address delivered before Foundry War Production Congress, 47th Annual Convention of American Foundrymen's Association, April 29th, 1943.



Interior view
OF A
PAYNE PRODUCT, 1943

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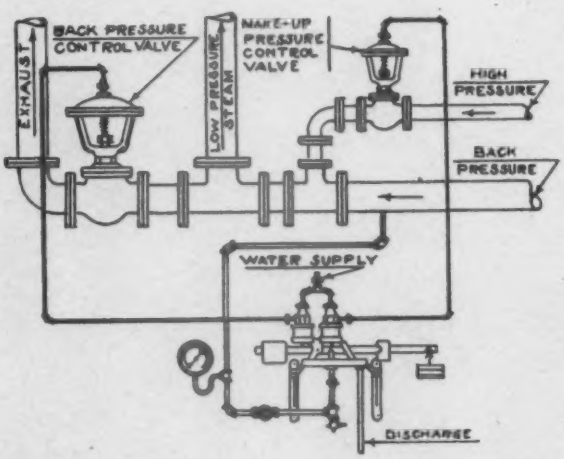
Operating Kinks

Simple Pipe Arrangement For Utilizing Exhaust Steam

By
W. F. Schaphorst, M.E.,
Newark, N. J.

"How can we rearrange our piping in order to utilize our exhaust steam for heating or processing?" is a common question. I have never seen or heard an answer that didn't tend to befuddle the mind of the questioner. So, here is my effort:

The sketch herewith shows one of the simplest and best hook-ups from every standpoint.



This arrangement makes it possible to utilize 100 per cent of the exhaust provided such usage is at all possible. Should there be a surplus of exhaust steam at any time, it is automatically switched by the regulator into the atmosphere. If on the other hand the amount of exhaust steam is insufficient for requirements, the sensitive control device automatically admits live steam make-up into the exhaust. Then, as soon as the required amount of extra heat is supplied the live steam is again automatically cut off.

In other words this arrangement guards the exhaust and saves live steam with the utmost precision—much more efficiently and economically than would be possible with the best of human supervision and hand control.

An important advantage is that this arrangement usually permits the utilization of much of the old piping and valves. That is, it is not necessary to install entirely new equipment throughout in attaining the highest degree of modernization.

He Heated His Exhaust Steam

Have you ever noticed that in the summer time it takes less gas to heat your bath water than in winter? Or if your bath water is always warm but at times not quite warm enough for a bath, have you noticed how little gas it takes to bring the temperature up to where you want it?

That is an important fact that is too frequently overlooked by plant operators and hard-headed business men. That fact contains a worthwhile lesson. Most plant operators know that exhaust steam, for instance, contains heat. But many of them do not know that exhaust steam contains the major portion of the heat that was originally obtained from the fuel. Because of this high heat content exhaust steam should always be used in one way or another, if possible.

Steam exhausted into the atmosphere has a temperature of only 212 deg. F. When that temperature is not high enough to do a certain heating job for you, remember the above bath tub experiences. By simply adding some heat to the exhaust you can attain almost any desired temperature. The exhaust is simply run through a superheater or heat exchanger and out it comes—just as hot as needed for your purpose.

A manufacturer who wanted to maintain a temperature of 250 deg. F. in a drying room had been in the habit of exhausting the steam from his simple engine into the atmosphere where it went to waste. He had been using live steam for the purpose because he had been led to believe that live steam was least expensive and that it was the best medium.

But he has learned a valuable lesson and now he does things differently. He just adds 38 deg. F. to the exhaust steam by passing it through a heat exchanger in the furnace of his boiler, and the required 250 deg. F. is easily attained.

Where exhaust steam can be used in this way it is plain that a condensing engine or a condensing steam turbine would be of considerably less value than the inexpensive, simple, non-condensing engine. It is impossible for a condensing engine or turbine to utilize even 40 per cent of the heat of the steam passing through it. The highest efficiency this writer knows of in steam plants was reported by the Twin Branch of the Indiana and Michigan Electric Co. in 1941. That plant reported an overall thermal efficiency of 33.49 per cent. That is very good, and perhaps the writer should not say that 40 per cent is "impossible" because, some day, it may be obtained.

However, what the writer is driving at here is that a simple engine can, by following the method outlined above, utilize nearly 100 per cent of the heat in the fuel by turning the exhaust to some useful purpose in heating coils, heating rooms, drying rooms, and other processes requiring a steady heat, but, in which a steam pressure is not so important. If a higher pressure is needed that, too, can be done—by means of a booster. The important point today is: don't waste heat.

Industry depends on gas for hundreds of vital wartime jobs—but only clean gas can assure continuous production. "Old Dusty"—Mr. Dustan Abrasion—causes wear, clogging, inefficient operation. Clean gas reduces your costs, betters your Public Relations. Install Blaw-Knox dependable gas cleaners now!

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(Photograph of actual plant installation)

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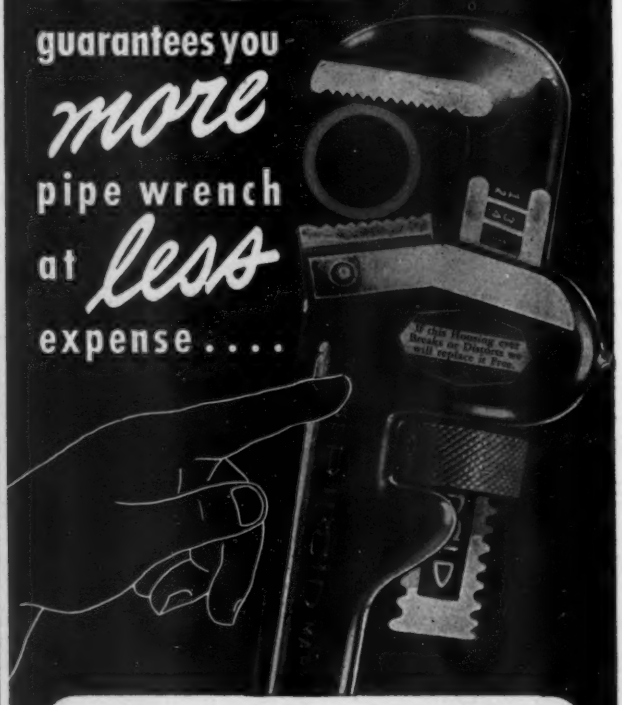
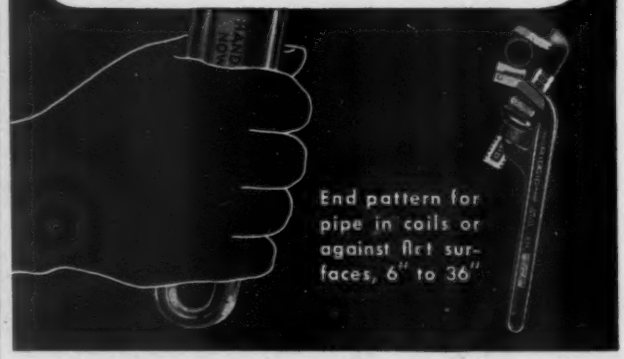


THERE'S no beating around the bush about that guarantee. That means you'll never have housing trouble or expense. Other things you'll like are the adjusting nut that won't bind, that always spins easily to size, whether 6" or 60" wrench; safe comfort-grip I-beam handle; handy pipe scale on the hookjaw; and the no-slip no-lock jaws. Ask your Supply House for the more-service less-upkeep RIDGID.



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Fast-Working Tools for War..and the Busy Peace Ahead

A Seeing-Eye For Gas Main Interiors

By

Donald J. Miller

Public Service Company of Colorado
Denver, Colorado

IN THE OPERATION of a gas distribution system, the need is frequently encountered for a practical and not too costly tool by means of which the interior of mains in use can be examined. Need for such a tool was felt recently in Denver to assist in locating suspected dust deposits in a 20-inch intermediate-pressure steel main, carrying natural gas at 40 lbs. per sq. in. from the Denver town border station to the various district regulator stations and industrial customers. The equipment was designed particularly for use in examining the interior of this 20-inch steel main and has not yet been used elsewhere.

The apparatus is in two units, one for introducing the light source into the main, and the other embodying the principle of the periscope, for making the visual inspection of the illuminated interior of the pipe. These units were made in our own machine shop and, by using scrap steel machined as required, pipe nipples, tubing, and plain junk, the cost of material represents only about 10% of the total cost.

Figure 1 shows the periscope and lighting unit, with mirror and light housing extended. The mounting base of each instrument is made of a Mueller 2½-inch safety nipple, used because its wall thickness allowed machining the unthreaded end to take the base of the stuffing box. The periscope tube, made of an old Chevrolet torque tube, is fitted into a simple stuffing box in the unthreaded end of the Mueller nipple. The mirror housing at the lower end of this tube is made of 2-inch standard pipe turned down to 2⅛ inches outside diameter. A disc of steel plate welded into one end of this nipple is threaded on the lower end of the periscope tube. The mirror housing is cut away to allow for necessary angular deflection in the line of sight, and to provide a protection to the mirror in case the tube should be accidentally thrust through to the pipe wall opposite point of entry. The mirror is cut elliptically so that when tilted at an angle a greater projected mirror surface is visible. It is mounted on a piece of light-weight galvanized sheet iron, which is soldered to a pin fitted into the mirror housing. From a very simple lug and cotterkey connection at the upper end of the mirror, a piece of piano wire is extended through the tube to a cap screw in the head assembly at its upper end, by means of which perpendicular angularity of the mirror can be adjusted. To eliminate lost motion in the butterfly action of the mirror mounting, a light coil spring is attached to the opposite end and anchored to the back of the mirror housing.

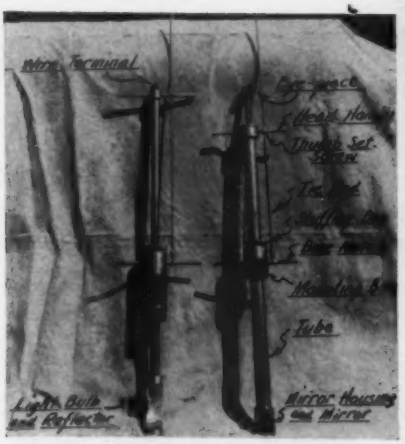

Figure 1—Light Unit and Periscope

Figure 2 is a sketch of the periscope head. The piano wire controlling perpendicular angularity terminates in a ball-type joint in the end of an adjusting screw, the outer or exposed shank of which is calibrated against a fixed pointer so that the angle of the mirror can be adjusted as desired. The long thread through the head block is packed to prevent leakage. A disc of ¼-inch plate glass is seated in recesses in the head block and cap against a cork gasket in the head block seat. The cap is drilled and threaded with standard ⅜-inch pipe threads into which a ⅜-inch nipple is screwed. A ⅜-inch half coupling at the upper end of this nipple is soldered to a piece of galvanized iron which replaces the lens of the right eyepiece of an ordinary welding goggle.

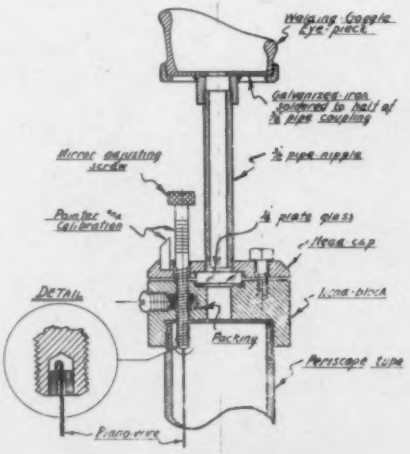

Figure 2—Periscope Eye-Piece

As shown in figure 1, the mounting base of the periscope is equipped with two handles for use in tightening the instrument into the fitting to which it is to be attached. Similar handles on the head are used as hand holds to force the periscope into the main and to twist the tube to effect changes in horizontal angularity of the mirror. The ¼-inch rod extending from one handle on the base to the handle on the head terminates at the lower end in a half-turnbuckle which is anchored to the base handle, while its upper end passes through a conical hole in a boss on the head handle. The boss is fitted with a thumb screw, by means of which the rod can be secured at any position along its length, preventing blowout of the tube due to gas pressure in the main. The rod is calibrated with one-inch markings, which indicate the depth to which the periscope mirror has entered the main. The conical hole in the boss on the head handle and the half-turnbuckle in the base handle allows for free rotation of the periscope tube through approximately 60° of angle.

The lighting unit has the same general construction as the periscope. The smaller diameter tube made of Shelby tubing has a 2-inch pipe housing at its lower end which contains the lighting unit. The cylindrical housing and an ordinary automobile headlight reflector are cut away along their common line of intersection and a 50-candlepower single-contact

Figure 3

6-8-volt bulb is fitted into the remaining portion of the reflector. The single conductor required is extended from the bulb socket up through the tube, and through a micarta plug in the head of the tube to the terminal. The grounded terminal is mounted on the side of the head.

Figures 3 and 4 are photographs taken in our pipe storage yard where most of the experimental work was conducted, and picture the method by which the units are attached to and inserted in a high pressure main. Mueller 2½-inch safety nipples are welded on the top of the main at the points chosen and gate valves are fitted to each nipple. The main is drilled through these valves with a Mueller D-4 drilling machine and a 2¼-inch O.D. shell cutter. The periscope and lighting units are inserted through the valves with the light directed toward the periscope mirror. The light bulb receives its energy from a truck storage battery through an extension cord.

After the inspection has been completed, the instruments are removed

Figure 4

and a Mueller 2½-inch plugging unit is attached to the valve, by means of which the inside plug is screwed into the female threads in the safety nipples. The valve is then removed and the safety nipple is capped. Use of these special tools and equipment eliminates the necessity of using costly gate valves, which are difficult to obtain, cannot otherwise be recovered from a high-pressure main, and which may be a source of future leakage trouble.

If it should ever again be necessary to use this tap, the plug can be removed by using an adapter on the end of the plugging unit mandrel. The cap is removed, the valve put on, and the inside plug can be taken out through the valve.

Figure 5 pictures the tools and fittings used. The Mueller safety nipple is 3 inches long and is the same outside diameter as 2½-inch pipe. Standard pipe threads are cut on one end and the other end is beveled for welding. The inside of the nipple at the pipe-threaded end is machined with tapered threads into which the inside plug is screwed. The 2½-inch cap fits on the nipple, enclosing the inside plug.

For rough prospecting, such as might be involved in searching for partial stoppage or for general inspection, the units have been separated by as much as 120 feet on straight portions of the 20-inch main. For closer scrutiny of inside pipe walls, considerable detail is discern-

(Concluded on page 41)

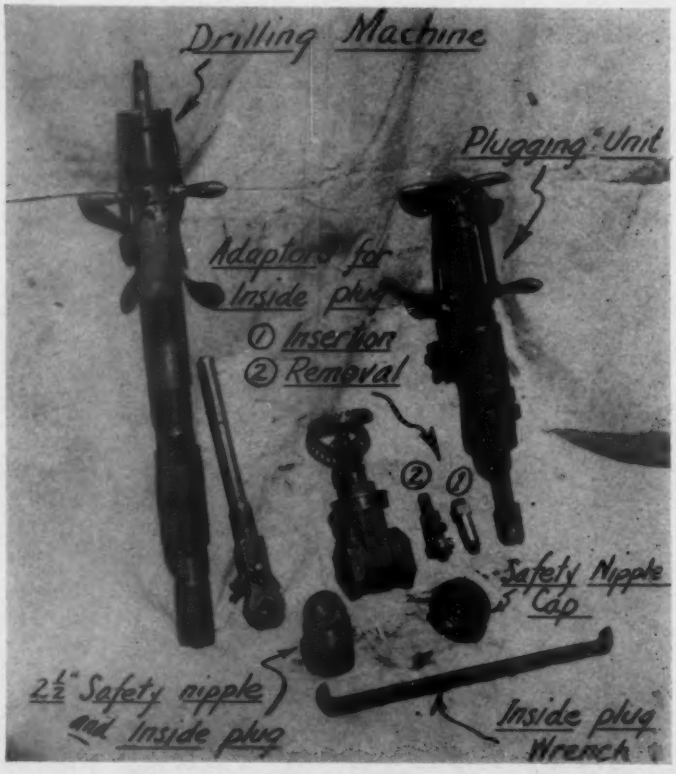

Figure 5

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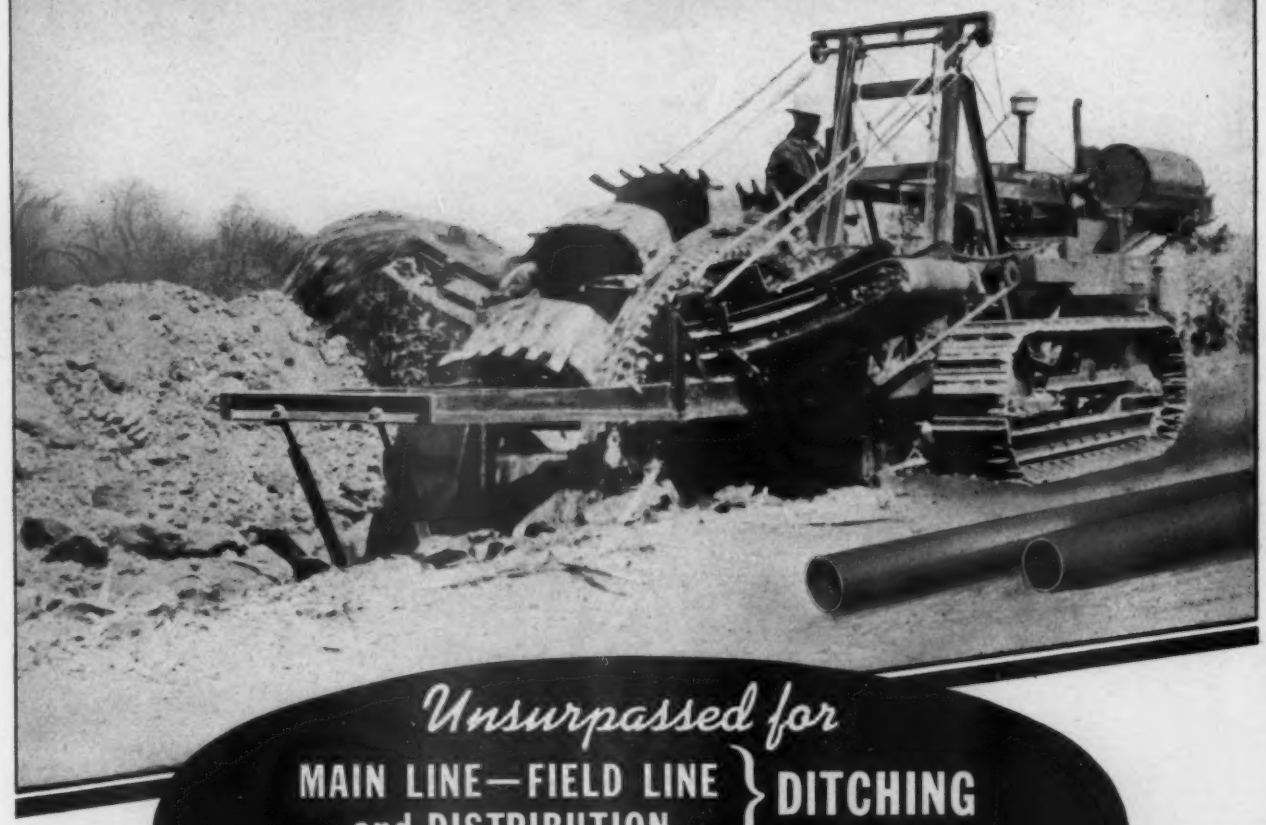
GEARED TO FIELD REQUIREMENTS



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Effects of War on the British Gas Industry

S. J. Beale

Photo Blank & Stoller

The gas industry in England, due to bombings and all out war activities, has had to solve many problems quickly in order to meet war and civilian demands for their product. In a paper presented at the Production and Chemical Conference, held in New York, May 24-25, S. J. Beale, General Manager, West Gas Improvement Co., New York tells how the British industry is operating at the present time.

YOU ARE HAVING your troubles in gearing your activities to the war, and the British have had theirs. While there is no direct parallel a relating of some of their successes and failures may be of value to you. It happened that from June, 1941, to June, 1942, my Chief, Sir Frederick West, was President of the Institution of Gas Engineers. During that period he was able to assist the A.G.A. with information needed here on various phases of the British Gas Industry in War, especially that concerning problems brought about by bombings. There are still many such problems to be solved in both countries but no doubt in Britain anyway there is now a certain degree of stability in such matters. Today I am not going to dwell on the physical aspects to any extent, but rather on controls and adjustments which are so necessary in the continually shifting sands of a War economy.

As an example of necessary change I would mention the official pamphlet "Notes on Town Gas for Air Raid Wardens" which, although, an official Government pamphlet, was drawn up by the London Regional Gas Centre in 1940 and had to be brought up to date in 1942 as a result of experience. In 1940 the Government asked that industrial plants produce smoke from their chimneys as an aid to camouflage. In 1943 this request was rescinded as a measure toward the economy of badly needed fuel. No doubt reduced bombings assisted the decision.

As you know, many acts of heroism have been performed in extinguishing fires on gasholders. About a hundred King George medals for bravery have been awarded Gas men for this work. Recently it has been suggested holder crowns be made of a rougher material to assist those who need to walk in such places.

Labor

Britain has shortages of critical materials as we have, as well as shortage of labor, and is continually trying to solve such problems. All engineers, including Gas Engineers, born between February 1, 1898 and January 31, 1923, must register before March 27, 1943. All men from 18 to 50 are registered for service with the armed forces and certain Civilian Defense forces. All women from 18 to 40, I believe, are also registered.

Women are used in the Gas Industry, and at the plants they are used on both day and night shifts. Here are some of their occupations:—

Carburetted Water Gas operators
Horizontal Retort stokers and dischargers
Dismantling retort settings
Oxide handling
Bricklayers' helpers
Coke loading
Filling tar barrels and unloading empty ones
Painting
Machine shop machine operators
Appliance fitting
Meter repairing, testing and reading

Certain tools have been designed specially for their use, such as smaller wheel barrows for oxide wheeling, smaller shovels, etc. During the last war women were working in Gasworks, and some of those same women are back again.

Clothes are rationed and the purchase of working clothes sometimes digs rather heavily into points allowed. For some articles the number of points is reduced or even eliminated, but only after issuance of a certificate by a Factory Inspector. Such items include overalls, footwear, aprons, protective garments, etc. For some, even though not clothing, the high purchase tax may be reduced if they are considered essential.

Substitution & Economies

To mention but a few items, with the normal ingredients of paints difficult to obtain, a tar base black paint has been evolved. In order to save metal, peace-time standards of bolt and nut sizes have been reduced in such matters as dimension across head and nut, a painless manner of saving metal.

Gas Company showrooms now have little merchandise to display, but many are now used for blood-bank donations, and as a meeting place of various local organizations and clubs—of great psychological value upon return to post-war business. This reminds me of a Gas Company showroom window which exhibited this notice "During an alert we shall remain open. In the event of a direct hit we shall close at once!"

Coal

This is a matter in which we are all vitaly interested just now. Since the war started Major Lloyd George, son of the British Prime Minister during the closing phases of the last war, was appointed as Minister of Fuel and Power. In July, 1942, he stated there was a gap of 12 million long tons between coal production and consumption.

Not only the collieries, but consumers, both industrial and domestic, helped to close this gap. Domestic consumers were asked to save 4 mil-

lion tons and now have about succeeded in a voluntary rationing scheme by using less than their normal allowances.

Coal miners were put on an output bonus scheme which apparently has not come up to expectations, in spite of the large percentage increased pay it incurred. This extra pay is not very attractive to them due to lack of consumers' goods available under the rigid British rationing scheme.

Gas Companies have been receiving a much poorer quality of coal and at higher prices. You have a parallel to that. Deliveries are erratic with the result coal cars pile up demurrage charges. The Government increased such charges by a very large amount in order to obtain continued use of badly needed cars. In many cases Gas Companies have not the labor required for unloading a larger than usual number of cars and are unable to help the condition. Their only recourse is to discuss the charges with the District Freight Officer in their area. If they have good powers of persuasion they may be able to get them reduced, just maybe!

The Ministry of Fuel and Power has issued pamphlets on various aspects of gas manufacture giving suggestions for checking the details of various plant operations, listing items in detail to ensure good efficiency. Such pamphlets include Carbonizing conditions, Retort house operation, Checking and cleaning auxiliary equipment, Steam raising, etc.

Scrap

Before I leave matters directly concerned with the manufacturing plant I would mention the subject of Scrap. It is of the greatest importance as you are well aware. It certainly seemed so to a British Government Official, who happened to be a lady, visiting a gasworks to survey unused plant for scrap. When informed that three tall towers were scrubbers and that only one was used in Summer and two in the Winter, all arguments to the contrary, she noted down one for scrap. Similar notations were made for purifying boxes. Then came three gasholders, large, medium and very small. The exasperated Engineer informed the lady that only the small one was used. He said the great big one was only put up to hide a new and ugly City Hall built nearby. The irate lady strode away and the next day an indignant Government Department asked for an explanation of such treatment of their staff. The Engineer explained it appeared the only way to handle one who obviously didn't know her job, and anyway Public Utilities were exempt from the order. The crushing retort from the High Official was "You are not a Public Utility, you are only a Gas Company!"

Competition

The Gas and Electric Industries have declared a truce in competition against each other "for the duration," and at the request of the Government. With many government officials Electricity minded it is sometimes hard for Gas men to maintain the armistice when such people talk glowingly in public of the wonders of Electricity, and not always without innuendos concerning gas.

War Time Efficiency

There was appointed under the Minister of Fuel & Power a Director of Gas Supply who had under him Regional Gas Liaison Officers. Regional Gas Engineering Advisory Boards were also appointed. The Director was Dr. E. W. Smith, a well known and highly skilled man. He worked hard in his job and did good work. For some reason not publicly exposed he resigned that position recently and his work is being done by others.

A Fuel Efficiency campaign was started in Gas Production. Many papers on the subject have appeared in the Technical Press, and excellent they are. All are well worth reading. The outstanding paper is by Dr. S. Pexton of London's Gas Light & Coke Company. The Coke Oven industry has also set up a Fuel Efficiency Committee.

In a War economy efficiency is more important than ever. Of necessity the British have had to look around for ways of improvement. Many investigators have found out much of value, and rarely have they hesitated to publish their findings for the benefit of many. The British Technical Press is as full as ever with good technical matter. Most of the Industry's Committees are at work on problems under consideration prior to the war as well as new ones. Research is still continuing, even though scarcity of materials has in some cases reduced activity. Much work is being done with post-war activities of the industry in view. Wars sharpen men's wits, this is certainly true of the Gas Industries of America and Britain. If one can believe what one reads the Gas Industry is going to show us some pretty fancy tricks when peace again prevails.

Meeting The War Condition

97% of British gas is distributed at 400 to 500 B.T.U., with one plant at 200, one at 375, others up to 450 which figure is the most popular with 500 next on the list, and many in between. There are only a few over 500 B.T.U. including two at 560 and two at 600. Scotland appears to have lower values than England, with a top of 475 and down to 425.

I mention these figures as many have reduced calorific values during the war in order to permit washing for benzole, an important war time measure in Britain. This results in

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a 15 to 20 B.T.U. reduction, which, in normal times would have to be made up by using additional coal. Reductions in declared values have been in the region of 10 to 60 B.T.U. The divergence is no doubt due to certain local conditions. There have been a very few cases where calorific values have been increased, these being from 20 up to 50 B.T.U. They were probably due to main capacities, poorer coal quality, etc. Experience has shown these changes have resulted in adjustments confined mostly to such appliances as water heaters. Who would dare suggest gas is not a flexible fuel? There is under discussion the suggestion of standardizing calorific values in Britain to 450, 475, and 500 B.T.U. No doubt this interesting subject will be perused in more detail after the war.

Fuel Target

It appears the public must register with Dealers in order to obtain supplies of solid fuels. In this case Gas Companies are "Dealers" as to coke sales. Gas as such is not yet rationed, and there is a national voluntary rationing of this fuel. There are penalties for mis-use under the "Fuel & Lighting Order." For example, hotels and theaters have been fined for unnecessary wastage. A man was fined for heating the kitchen with his oven, as was a store keeper for substituting gas for central heating. As you have done, Gas Companies advertise for fuel saving. It is said the King has had lines painted around bath tubs in Buckingham Palace at the five inch level in order to save hot water.

In many establishments "Fuel Wardens" have been appointed. It is their duty to see that no unnecessary burners are on or turned too high. This is especially true of restaurants, canteens, etc. A national chain of restaurants has put in this scheme with excellent results. Wardens report each week the amounts of coal, coke, gas, etc., used and savings compared with the previous week. This is reported at a weekly meeting of the staffs, and is enthusiastically received. War Bonds are given as prizes.

There is an intensive Fuel Conservation Campaign in which over 160 exhibitions have been held. The Ministry of Fuel & Power is giving an intensive course of instruction to Technical Officers of the Army in the operation and maintenance of automatic equipment installed in Army establishments.

During his early months of Office, Dr. E. W. Smith, Director of Gas Supply visited areas of shortage and also large industrial plants using gas as fuel. He concluded that where definite shortages existed it was better to effect economies in usage rather than build new plants. He thought a national saving of 20% could be effected, and this without major changes of design or in making elaborate tests; but by using ordinary common sense.

Here are some of the things that were happening. A furnace with a capacity of 15 to 20M. per hour was clotted with soot, and doors fitted badly. Furnaces under full heat sometimes contained only a small percentage of capacity. In another plant they expected to save 40% of gas used. In one year output was doubled, and they were using less gas. One large glass manufacturer made closer adjustments to the position and angle of burners, eliminating some. Alterations were made in gas ports to save compressed air. Consumption was reduced from 12.6 to 3.9M per hour.

On the solid fuel side, one plant in Scotland saved 7,000 long tons of coal per year, and another saved 1,000 tons and increased output by 20%. Under the "Waste of Fuel Order" Gas Companies and others have been fined for selling fuel to unregistered customers, or amounts above prescribed quantitities. One firm was fined $1,500 for selling coal to employees.

On the liquid side, one Gas Company was fined $300 for allowing the Manager and others to use benzole in their cars and for not keeping accurate benzole records. The Manager was fined $500, one of his men $100 and the Distillery Company $550 for returning some distilled spirit to the plant without a permit. In another case a Manager was fined $325, and his District Superintendent $50 for "Technical breaches of the regulations" when using benzole in their cars for Company use.

The Ministry of Fuel & Power issues a monthly sheet "Fuel Efficiency News" giving data on methods of fuel conservation showing actual cases and telling how to get in touch with Regional Committees. Astonishing results are being obtained.

Here is the Fuel Target set up as an experiment for the year beginning July 1, 1942. It was expected a revision would be required after the year is completed, probably in the upward direction, especially a raising of the gas equivalent. Except for solid fuel and perhaps paraffin the scheme appeals to be only a try-out for future possible rigid fuel rationing.

1 unit—½ cwt. (56 lbs.) coal or coke
500 cu. ft. gas
50 units of electricity
1 Imp. gallon paraffin

At a luncheon meeting, 1943 Joint Production and Chemical Committee Conference. L. to R: W. Cullen Morris, Chairman Luncheon and War Conference (N. Y., A.G.A. Representative N.T.C.P.C., New York) T. L. Robey, Chairman, Chemical Committee, Washington, D. C., F. M. Banks, Los Angeles, California, E. Holley Poe, Director, Natural Gas and Natural Gasoline Division of Petroleum Administration for War, Washington, D. C., S. J. Beale, New York City.

For each person living in a house an additional allowance of 15 units is allowed, adults and children alike.

Average consumers use three quarters of fuel for heating rooms and water, one fifth for cooking, the rest (one twentieth) for lighting, gas radios and gas irons, etc.

1 ton of coal or coke =40 units
or 20,000 cu. ft. of gas
or 2,000 units of electricity

Rooms	N	M	S
1	80	60	50
2	90	70	60
3	110	90	70
4	120	100	80
5	140	110	90
6	150	120	100
7 or more	170	140	110

Up to the present if undue hardship is experienced in the amount of solid fuel allowed one must get in touch with the Local Fuel Overseer for an adjustment.

The British Commercial Gas Association have a number of movies available, and even pre-war several of these have been shown in public theaters. They are available to Gas Companies and others. Several have been produced during the war. One of the latest is "Eating at Work" and deals with the preparation of balanced meals for war workers.

Increased Charges

Due to increased cost of coal, labor and equipment a large number of Gas Companies have found it necessary to increase their charges. This is done by obtaining a license from the Government for such increases, and of course there are definite requirements to be met before they are granted.

Speaking of charges reminds me that Britain has a large number of pre-payment meters. In English currency 12 pennies are equivalent to 1 shilling. Due to some quirk of psychology some people seem to think twelve separate pennies placed in the meter at intervals will give them more gas than the use of one silver shilling. Actually the amount of gas is the same. Some of you will know the English penny is very large and therefore contains much copper. An attempt is being made to get people with such meters, with both penny and shilling slots, to use shillings only. This will not only release much copper for the war effort, but also helps in collections; especially where collectors are women as the copper is very heavy for them to carry.

Oil

It is essential Britain conserve all possible uses of petroleum products as they have to be imported. Their base gas load is coal gas, peaks being made up with C.W.G. and some war time reduction of calorific values are no doubt due to the need of using less oil even though not much C.W.G. is made and the calorific value is much lower than yours.

Motor transport must continue especially as all cars for private use have been forbidden for a long time. In 1936 coke oven plants extracted benzole from 97.9% of coal carbonized but gasworks extracted benzole from only 47.3%, apparently due to the small size of many plants. Since then many benzole extraction plants have been built. But these are not enough for the requirements, what with vast quantities of high grade fuel needed for the R.A.F., Tank Corps, etc.

As in the last war some "gas-bags" have been fitted to the tops of cars and trucks. Rather short distances are possible between refilling at Gasworks. Some creosote was used before the war and may be still in use. The anticipated large saving is to be with producer gas attachments, chiefly for use with busses and trucks. There is a "Mobile Producer Gas Association" and fuels contemplated are activated high temperature coke, low temperature coke, charcoal, and anthracite coal. This latter is likely to be used in the greatest volume.

I have seen the following figures: For one Imperial gallon of gasoline the equivalent fuel consumption at the car transmissions is—

14 lbs. producer gas
15-17 lbs. coal gasification
30-45 lbs. coal hydrogenation
16-23 lbs. steam engine
30 lbs. electric battery

As a start there are going to be about 6,000 producer gas units for vehicles. The Minister of War Transport has ordered owners of ten or more vehicles to convert 10% to producer gas if they gross over two to three tons each.

In Scotland 651 busses are to be converted this year. 107 have been adopted and have run 2.5 million miles and saved 415,000 Imperial gallons of liquid fuel.

London is to have 550 busses converted, with a saving of 3.5 million Imperial gallons per year. Each bus burns one long ton of anthracite per week and will be refueled each 80 miles. Twenty-seven service stations are arranged.

I conclude with a word on the future. As Major Forward said yesterday, the Brtish are giving a great

(Concluded on page 41)

L. to R.: H. L. Gaidry, Chairman, Technical Section, New Orleans, La., H. S. Lipp, Chicago, Illinois, Alexander Forward, Managing Director, A.G.A., New York, Walter D. Binger, Chairman, National Technological Civil Protection Committee, New York, E. W. Zimmerman, Chairman, Gas Production Committee, Everett, Mass.
Photos A. Gordon King

Cleaning Gas Distribution Mains With Hot Oil Circulation

By

Floyd O. Crawford

Portable steamer unit of the coiled-tube type with water and fuel storage mounted back of truck cab. Heat exchanger and also high-pressure pump included in this mounting for hot oil circulation. Sufficient lighting equipment is included to do any job by night.

THE CLEANING of gas distribution mains has been a serious problem in some places where manufactured gas is distributed. Various solvent solutions have been used. These have not only been expensive but the process of cleaning has been long drawn out, and in some cases has yielded only temporary relief from stoppage. Leaking joints have also been apt to result where bell and spigot pipe is cleaned.

The necessity of cleaning is becoming constantly greater because of the increased quantities of gas distribution systems are called upon to handle, and the inability to replace or add to present facilities during these times. Until recently portable equipment was not available for any method other than that making use of solvents to clean these lines, and this method involved taking the lines out of service. Since tar and naphthalene once melted tend to remain for some time in warm oil without crystallizing out, a system of hot oil circulation for cleaning was developed, making use of a portable type coiled-tube steam unit as the source of heat.

Due to the small amount of metal in the coiled-tubes and the very small amount of water in the system, steam may be raised to the full working pressure of 300 pounds per square inch within two minutes of the time of starting up the cold unit. The tubing used is hydrostatically tested to 800 pounds pressure, and contains such a small amount of water or steam that a tube rupture would not release enough energy to disrupt or damage any of the adjacent equipment. Safeguards are built into the unit which make it fully automatic after it is once in operation.

In the apparatus which has been developed, steam is run through a portable heat exchanger, transferring its heat to a stream of oil which flows across the exchanger tubes and is heated to a temperature above the melting point of tar, thus causing the tar to be carried along to a collecting basin. This circulation of oil may continue until the deposits are removed from the line without any fire or explosion hazards.

The system is closed, oil being handled through the exchanger and thence to the pipe line through high-pressure pumps without admission of air. The equipment is mounted on a truck which may be driven over the city streets as easily as a gas service truck.

Excessive heat for any length of time is undesirable due to the expansion and contraction of laterals and services, but with this apparatus the temperature can be held at any point desired by controlling the amount of steam passing through the heat exchanger tubes.

Circulation can be obtained by connecting onto a service stub that is not in use and allowing the oil to flow toward the nearest drip pot. There it can be picked up by connecting a suction line from the drip riser (if it be of a sufficient size) to the intake of the high pressure pump. If drips are not available or are of inadequate capacity a temporary drip pot can be installed by cutting out a short section of main and coupling in the pot. It will then also serve for the next section to be cleaned without moving it.

Since the amount of oil flow as well as the temperature may be controlled, the flow can be increased to the extent of flushing the line so that the heavy particles that are not soluble will be carried along to the collecting basin, where they may be removed. The use of a light oil for this circulation will saturate the jute in the joints of bell and spigot pipe, tending to reduce or even to stop joint leaks.

Control and checking of this portable equipment is usually centralized in the truck driver, as the unit is idle when the truck is in motion, and the truck must be stationary when the unit is being used on circulation.

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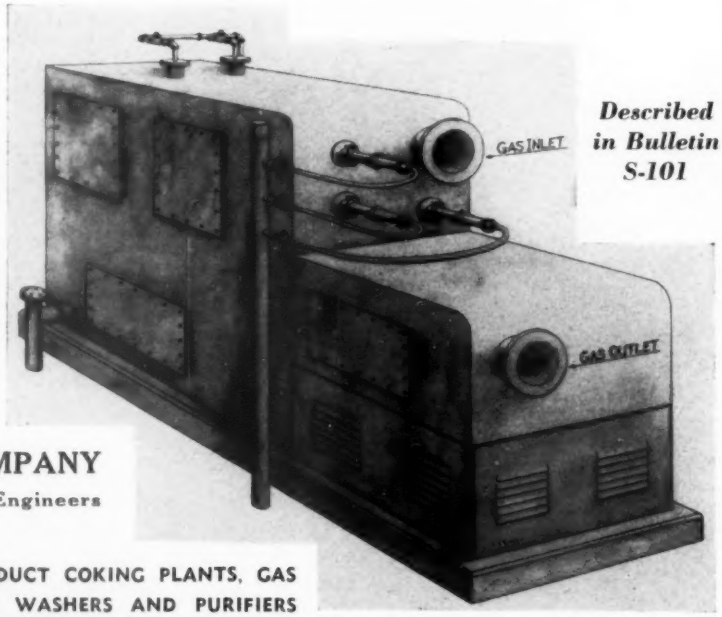

Described in Bulletin S-101

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Servel Receives Safety Award

A special award for Distinguished Service to Safety, was presented to the men and women employees of Servel, Inc., on June 12, in recognition for their remarkable showing in establishing a lost-time accident record which was greatly below the average for industries performing similar operations during 1942. This is not the first award given to Servel employees by the National Safety Council, who select the winners.

The award is in the form of a plaque, and was presented to Dr. Thomas Dobbins, medical and safety director of Servel who accepted it on behalf of the employees. The presentation was made by Daniel Thompson, Chief of the Radio Section, National Safety Council, in the presence of Servel employees and executives at the Evansville plant. The proceedings were broadcast on a national "hook-up" as part of the radio production: "Fashions in Rations."

In citing Servel for its safety record, Mr. Thompson said that the record at the plant was reduced "despite the stress of your heavy wartime production schedules."

Dr. Dobbins, in accepting the plaque, said that the safety record on which the award was based, could not have been achieved without the wholehearted cooperation of every worker.

Underfiring A Coke Oven Battery With Refinery Oil Gas

By
E. E. Witham and J. H. Long
Gas Department,
Philadelphia Electric Company
Philadelphia, Pa.

IT IS THE PURPOSE of this paper to describe the operation and to discuss the advantages of underfiring a coke oven battery with refinery oil gas, as carried on at Chester, Pa., since October 1942.

Reasons for Underfiring With Refinery Oil Gas

There are two economic reasons for using refinery gas, instead of coke oven gas or producer gas, for bench fuel.

1. To increase gas production capacity with a minimum of additional investment.
2. To effect a saving in the overall cost of producing gas.

These two objectives have been attained, and it is proposed to continue the present method of operation until some major alteration in the economic situation occurs.

The coke oven battery consists of twenty-five ovens having a coal capacity of 13.23 tons each. The Koppers underjet design having waste heat recirculation was selected because it appeared to have certain advantages as to flexibility of coking time, and for the use of refinery oil gas for underfiring. This battery was placed in operation in May, 1942.

Philadelphia Electric Company is a gas and electric utility, and in the operation of a coke oven battery is interested in the production of a maximum quantity of gas. The marketing of coke is incidental to its operations, and it is desirable that the fluctuations of the coke market have a minimum effect on the production cost of gas. Therefore, the size of the battery was dictated by the amount of coke which could be efficiently used for gas manufacturing at our reformed oil gas and water gas plants. Advantage is taken of the fact that the type of oven selected is capable of efficient operation on coking schedules ranging from seventeen to thirty-six hours; and of the remarkable flexibility of the reformed refinery oil gas process which permits a variation in generator fuel coke used per MCF of from six to twenty-four pounds. Thus, if at any time the coke market were unprofitable, no dependence need be placed on the sale of coke for revenue because:

(a) All the coke made can be used for gas production.
(b) If necessary, the amount of coke produced can be controlled by lengthening out the coking time; thus the effect of coke price on production cost of gas is minimized.

The gas required for underfiring at the rate of 1200 B.t.u. per pound on a 17½-hour coking schedule amounts to 11,000 therms per day, equivalent to 2,110 MCF of 520 B.t.u. coke oven gas. This gas has a specific gravity of 0.40 at 520 B.t.u. while the sendout gravity at the Chester plants is 0.68. Therefore, a mixture of 1800 B.t.u. refinery oil gas and inert gas, the mixture having a heating value of 520 B.t.u. per cubic foot and a specific gravity of about 1.0, can be added to the low gravity coke oven gas, bringing the final gravity up to 0.68. The amount of refinery gas-inert mixture which can be added is about 85 per cent of the volume of the coke oven gas. Thus, the total increase in system production capacity due to underfiring the battery with refinery gas is as follows:

	MCF per day
Coke Oven Gas formerly used for underfiring and replaced with oil gas	2,110
"Cold Enriched" Gas to raise Coke Oven Gas to 0.68 gravity	1,800
Total Increase in System Production Capacity	3,910

The burning of refinery gas under the ovens has not increased the coke oven labor cost. The production of the additional cold enriched gas uses no labor, the inerts being produced by the use of additional blow run on the reformed oil gas generators.

The increase in capacity of 3,910 MCF per day entailed no investment except for a calorimeter and small piping changes. A gas-air proportioner was already installed, having been used on the old Morrisey battery. The total cost of all new and old equipment used for refinery gas underfiring would not equal fifteen per cent of the cost of a water gas set of equal capacity.

The investment necessary for the installation of producers to underfire the battery could not be justified. Refinery oil gas can be used with very little investment, and the overall costs are less than would result if producer gas were used.

The present operating saving amounts to $25,000 per year. This saving varies with the cost of refinery oil gas which is now near the maximum contract price. With an oil gas price which might be considered a long-term average, the saving would amount to $28,000 per year.

Preliminary Experience in Underfiring High B. t. u. Gas

Prior to the building of the new coke oven battery, we had some experience in the burning of high B.t.u. fuel gases. When the Roberts Morrisey battery was first placed in operation in 1925, serious difficulties developed in the burning of coke oven gas. Bench fuel was conducted to the heating elements of the Morrisey battery through bottle brick extending from the top of the oven down to the regenerators. The exposure of the coke oven gas to this long passage through the hot brickwork caused pyrolysis to occur and carbon was deposited in the bottle brick. At one time this condition was so serious that it threatened to shut down the battery. Finally, after considerable study, a gas-air mixing apparatus was installed to dilute the coke oven gas with about one-third of its volume of air. This equipment continued to operate until the battery was shut down in 1938. It was successful in limiting the quantity of carbon deposited in the bottle brick to the point where it could be controlled by periodic blowing and rodding.

In 1931, consideration was given to the possibility of underfiring the old battery with refinery gas. As no refinery gas was available at the plant at that time, a preliminary test was run using propane. The propane was diluted with stack gas and although the tests were on a very small scale, having been made on only one element of one oven, the following conclusions were drawn:

1. No difficulty was experienced in burning the propane-inert gas mixture.
2. Carbon deposits were not serious at the flue temperatures attained in the test. These temperatures were about 300 degrees F. below normal.
3. High fuel gas pressures would be necessary. This was to be expected from the high gravity of the mixture being burned, and would not have been practical in the old battery because it would have aggravated a leakage condition which was already serious.

When the new coke oven battery was being designed, the possibility of using refinery oil gas for underfiring was continually kept in mind. The battery was placed in operation in May, 1942 and operated on coke oven gas for several months until the operation had shaken down to normal. It was then decided to try a refinery gas-air mixture on two heating walls. In spite of the operating difficulties which invariably attend a small scale test using improvised equipment, the tests were continued for two months with increasing success until October 5, 1942. By this time the Kemp machine, which was a hold-over from the old battery operation, had been reconditioned and adapted to the production of a gas mixture containing about fifty per cent refinery gas and fifty per cent air, and having a heating value of 740 B.t.u. per cubic foot. At this time we started heating four walls with the mixture, and as this operation appeared to be successful, the entire battery was converted to refinery gas underfiring on October 14, 1942.

Theoretical Considerations in Underfiring With Refinery Oil Gas

The tendency of coke oven gas to deposit carbon when heated in underjet risers or in gun flue gas channels is well known. Those constituents in coke oven gas responsible for carbon formation are ethane, methane, and illuminants (benzene, ethylene). The analysis of refinery oil gas, as compared with coke oven gas and producer gas, is as follows:

This analysis of the refinery gas shows that the constituents responsible for carbon formation are much greater than in coke oven gas and a greater deposit of carbon would be expected and it was necessary to reduce this formation to the extent that it would not affect the heating of the ovens.

		Refinery Oil Gas	Coke Oven Gas	Producer Gas
CO_2	Carbon Dioxide	0.7	1.7	3.5
O_2	Oxygen	0.7	0.5	0.5
N_2	Nitrogen	2.0	6.2	54.5
H_2	Hydrogen	5.3	53.2	10.0
CO	Carbon Monoxide	1.7	5.6	30.0
CH_4	Methane	26.0	29.2	1.5
C_2H_4	Ethylene	5.5	–	–
C_2H_6	Ethane	19.4	–	–
C_3H_6	Propylene	12.2	–	–
C_3H_8	Propane	17.8	–	–
C_4H_8	Butylene	3.7	–	–
C_4H_{10}	Butane	3.3	–	–
C_5		1.7	–	–
ILL		–	3.6	–
Total		100.0	100.0	100.0

Haslam and Russell ("Fuels and Their Combustion") give us three theories that have been advanced to explain the way in which hydrocarbons burn:

"(a) That the hydrogen of the hydrocarbon burns with oxygen in preference to or before the carbon, (b) that the carbon burns in preference to the hydrogen, and (c) that there is an initial association of oxygen with the hydrocarbon molecule, forming intermediate, "hydroxylated" compounds, which, in turn, burn or are broken down thermally."

Haslam and Russell go on to say that neither of the preferencial combustion theories explain all the known facts, and the reader may infer that the hydroxylation theory appears most sound.

Hydroxylation consists of the addition of oxygen to a hydrocarbon molecule, producing an intermediate, unstable compound. These hydroxylated compounds tend to burn to carbon dioxide and water, without the deposition of carbon; but if hydroxylation does not occur, the hydrocarbon may be thermally decomposed to carbon and hydrogen.

To quote further:

"Thus in the ordinary combustion of hydrocarbons, there is a race between thermal decomposition and hydroxylation. If the conditions favor hydroxylation (such as preheating the hydrocarbons and air, and allowing time for the entrance of oxygen into the hydrocarbon molecule), there will be no soot. If, however, conditions favor cracking, as, for example, if the hydrocarbons and oxygen from the air are not thoroughly mixed together, the heat from the combustion of part of the hydrocarbon decomposes or cracks the remainder."

Our experience with the use of a coke oven gas-air mixture on the old Morrisey Battery to reduce the formation of carbon in the gas passages led us to believe that the conditions in the underjet risers would favor hydroxylation if sufficient air were thoroughly mixed with the refinery gas before it is passed through the hot risers. Therefore, it was decided to use a refinery gas-air mixture.

The oven chambers at Chester are 24 feet 5 inches long inside doors by 14 feet—0 inches high, with an average width of 20 inches. This oven is unusually high and in order to successfully underfire it with refinery gas it was necessary to obtain a refinery gas-air mixture and a waste gas recirculation rate that would result in an even flue temperature, prevent the formation of carbon and permit the coke oven gas underjet nozzles to be used on the refinery gas-air mixture.

In order to maintain an even temperature from the top to the bottom of the flue it was necessary to establish the proper flame conditions. It is generally recognized that the length of flame depends upon the velocity of the mixture entering the flue, the density, which affects the diffusion rate and the speed of flame propagation which is affected by the rate of waste gas recirculation.

This problem of preventing the formation of carbon is closely related to that of obtaining even flue temperatures, because the carbon formation in the gas risers decreases with increased velocity as the gas passes through the riser on the upburning side; and the removal of carbon from the gas riser on the down-burning side is accelerated as

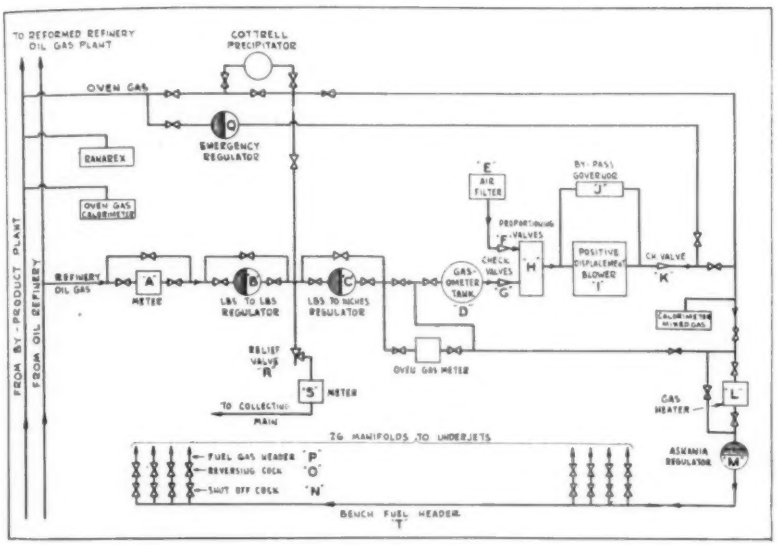

Fig. No. 1—System for underfiring underjet Battery with Refinery Gas-Air Mixture. Chester Coke Oven Plant, Philadelphia Electric Company.

the rate of waste gas recirculation is increased. The air mixed with the refinery gas not only helps to decrease carbon formation by causing hydroxylation, but also has an effect on the velocity and density of the gas entering the flue. For these reasons the quantity of air mixed with the gas is a factor which must be considered both from the standpoint of carbon formation and of proper oven heating.

Present Operation Using Refinery Oil Gas

Figure I is a diagram showing the equipment used to obtain the desired refinery gas-air mixture.

The refinery gas used for underfiring the battery is supplied from a nearby oil refinery through a six-inch welded steel main and first passes through a high pressure positive displacement meter (A) at a pressure varying from twenty to fifty pounds per square inch.

After the gas leaves the meter it passes through a pounds to pounds regulator (B) where the pressure is reduced to 1.5 pounds per square inch gauge pressure, and then through a pounds to inches regulator (C), which further reduces the pressure to approximately 5.0 inches of water. The gas then flows into a small holder (D) called a gasometer tank. This consists of an inverted cylindrical float in an oil-filled tank. The gas enters and leaves through two vertical pipes. Sufficient pressure from the regulator (C) must be maintained to keep the float at a constant level.

It will be noted that a high pressure refinery gas meter as well as a low pressure coke oven gas meter are installed. Both are of the positive displacement type. The latter had been used with the old battery; but when underfiring with refinery gas it was found to have so much inertia, due to its size, as to be slow in starting after the pause during reversal. This sluggish operation resulted in "starving" the gasometer tank of the Kemp machine of gas, and the automatic control would shut the machine down. The high pressure meter is smaller and a higher differential pressure can be carried while it is starting up. It, therefore, accelerates more rapidly.

A further cushioning effect was obtained by connecting the Cottrell precipitator to serve as a reservoir of gas between the high and low pressure regulators. The use of the Cottrell as a Precipitator is desirable when using coke oven gas, but is not necessary with refinery oil gas.

From the gasometer tank (D) the gas passes through a check valve (G) to the Gas and Air Proportioning Machine. This machine includes air filter (E), Inlet check valves (G and F), proportioning valves (H), positive displacement blower (I), by-pass governor (J), and an outlet check valve (K). Its purpose is to mix the refinery gas with air in previously determined proportions. The air is drawn in through the fine mesh filter (R) past the floating check valve (F) to the proportioning valve (H). Gas from the gasometer tank (D) passes another floating check valve (G), and also enters the proportioning valve (H). The purpose of the check valve (F) is to prevent the escape of gas to the atmosphere in case the machine stops. The proportioning valves (H) admit the refinery gas and the incoming air in the proper proportions.

The gasometer tank is equipped with a limit switch that shuts down the Kemp machine and blows a siren if the gas supply in the tank decreases below a predetermined point. This eliminates the possibility of pumping air into the fuel gas header and warns the operators that the refinery gas supply has failed.

Positive Displacement blower (I) draws the gas and air from the proportioning valves (H) and places the gas-air mixture under pressure. The blower is driven through a Texrope drive by a twenty horsepower induction motor and is equipped with a by-pass governor (J) which maintains the discharge pressure constant. The check valve (K) in the discharge line prevents reverse flow of the gas.

After the refinery gas-air mixture leaves the blower (I) it passes through the heater (L) where the temperature of the mixture is increased to 120 degrees Fahrenheit. The gas-air mixture then passes through the Askania regulator (M) and enters the bench fuel header (T). Regulator (M) maintains the desired pressure on the bench fuel header. From the bench fuel header the mixture passes through the shut off cocks (N), through the reversing cocks (O) and into the fuel gas header (P). The fuel gas header supplies the mixture to the jet nozzles.

An emergency regulator (Q) is installed to feed gas from the coke oven gas main to the bench fuel header in the event that the pressure drops to six inches of water pressure, due to a shut down of the blower or other reasons. Thus a positive pressure on the header is always maintained. An automatic alarm warns the operators if the blower stops, and the emergency regulator supplies enough fuel to prevent rapid cooling of the ovens until the refinery gas supply is restored. In case of a prolonged interruption of refinery gas supply, the ovens can be quickly converted to complete oven gas underfiring as explained hereafter.

A relief valve (R) is installed in the line between the pounds to pounds regulator (B) and the pounds to inches regulator (C). The discharge from the relief valve passes through a meter and into the collecting main. The purpose of this valve is to discharge refinery gas into the collecting main in the event that the pounds to pounds regulator does not

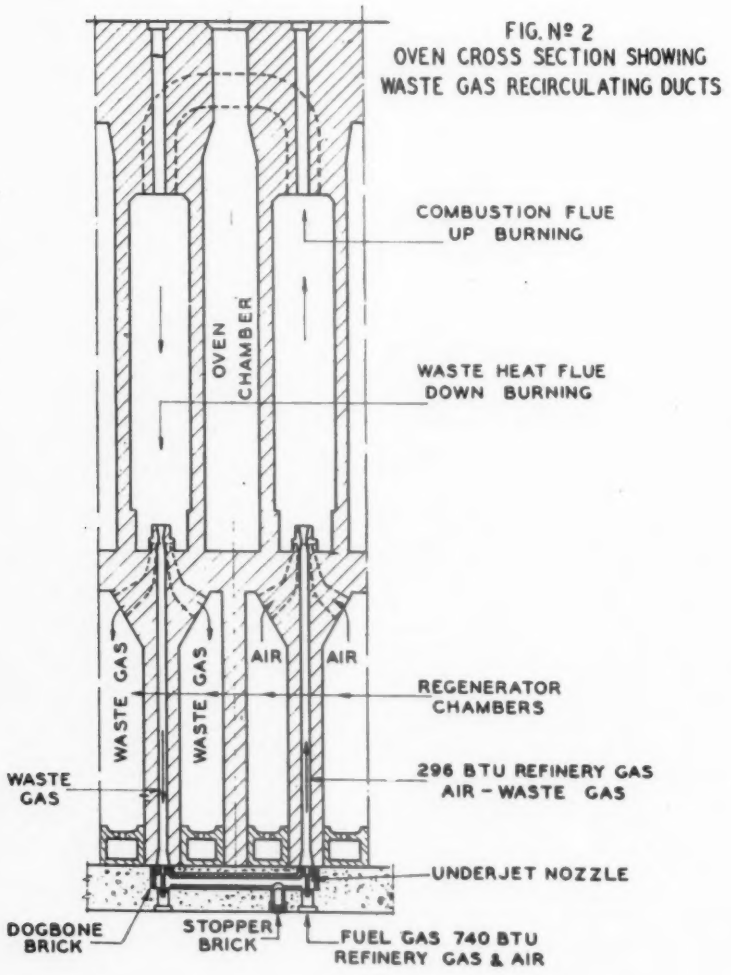

FIG. Nº 2
OVEN CROSS SECTION SHOWING
WASTE GAS RECIRCULATING DUCTS

close tightly on the reverse of cycle, and the pressure increases to 5.0 pounds per square inch.

The foregoing description, referring to Figure I, explains the mixing of the refinery gas-air mixture and the delivery of this mixture to the jet nozzles. In Figure II is shown the injection system of recirculating waste gases employed in the Koppers-Becker oven. A portion of the products of combustion is drawn from the waste gas stream at the base of the down-flowing flue and aspirated through the underjet and cross-connecting ducts. In this system the refinery gas-air mixture and recirculated waste gas are thoroughly mixed by the action of the jet. This diluted mixture passes through the underjet gas risers and enters the up-burning combustion flues. Regenerator air also enters the base of the up-burning combustion flues.

The coke oven battery of twenty-five ovens has a total of twenty-six heating walls with sixteen underjet nozzles supplying bench fuel to each wall giving a total of 416 nozzles. When the preliminary tests were conducted on the use of refinery gas for underfiring the thought of using the coke oven gas underjet nozzles when underfiring with refinery gas was always kept in mind. This would eliminate the necessity of changing all the nozzles when changing over to oven gas and when changing back to refinery gas underfiring.

As a result of the preliminary tests conducted on two and later on four heating walls, a proper balance was reached that enabled the use of refinery gas for underfiring with even wall temperatures using the coke oven gas underjet nozzles without the formation of carbon in the gas risers.

Refinery gas as received varies in heating value from 1,500 to 2,000 B.t.u. per cubic foot. This gas is mixed with sufficient air in the Kemp gas and air proportioner to maintain the heating value of the refinery gas-air mixture going to the battery at 740 B.t.u. Changes in the heating value of the refinery gas are compensated by manual changes to the proportioning valves.

The refinery gas-air mixture in the manifolds to the underjet nozzles is under 16.3 inches water pressure. After the mixture passes through the nozzle it is mixed with the recirculated waste gas at the rate of 1.5 volumes of waste gas to 1.0 volume of the refinery gas-air mixture. This lowers the calorific value of the mixture going through the gas riser and entering the flue to about 296 B.t.u. per cubic foot.

With the battery operating on a net coking time of seventeen hours and twenty-eight minutes, the coking rate is 1.14 inches per hour. Temperatures of the coke at this coking rate are as follows:

Average coke temperature, coke side .....1,605° F.
Average coke temperature, pusher side .....1,658° F.
Average coke temperature, of oven .....1,632° F.

The average cross wall temperatures of the flues are shown below. It is desirable to carry somewhat higher temperatures in the coke side flues than on the pusher side to thoroughly coke the coal in the widest part of the oven. The Chester ovens have a two-inch taper.

Flue No.		*Temperature at airport °F.*	*Temperature at Horiz. Flue °F.*
PS	1	2335	2190
	2	2465	2320
	3	2490	2330
	4	2500	2340
	5	2505	2345
	6	2525	2350
	7	2540	2380
	8	2560	2390
CS	8	2570	2410
	7	2580	2410
	6	2590	2440
	5	2600	2440
	4	2610	2460
	3	2620	2470
	2	2610	2450
	1	2490	2330
Average		2537	2378

The underjet nozzle sizes used for both coke oven gas and refinery gas underfiring are in following table:

Close regulation of the quantities of air for combustion, a constant uniform waste gas recirculation rate and constant header pressures are required when using refinery gas. At first it was necessary to rod several gas risers each day because of excess carbon formation, but only for a short time until the operators were familiar with handling the new gas. The battery operates on twenty-minute burning cycles with a pause between reversals. Oven temperatures are increased or decreased by changing the burning time and length of

Flue No.		Inside Walls Area Sq. In.	Inside Walls Diameter Inches	End Walls Area Sq. In.	End Walls Diameter Inches
PS	1	0.0903	0.339	0.0767	0.313
	2	0.0767	0.312	0.0620	0.281
	3	0.0621	0.281	0.0491	0.250
	4	0.0621	0.281	0.0491	0.250
	5	0.0621	0.281	0.0491	0.250
	6	0.0621	0.281	0.0491	0.250
	7	0.0660	0.290	0.0519	0.257
	8	0.0660	0.290	0.0519	0.257
CS	8	0.0683	0.295	0.0519	0.257
	7	0.0683	0.295	0.0519	0.257
	6	0.0683	0.295	0.0556	0.266
	5	0.0683	0.295	0.0556	0.266
	4	0.0683	0.295	0.0581	0.272
	3	0.0784	0.316	0.0581	0.272
	2	0.0903	0.339	0.0692	0.297
	1	0.0951	0.348	0.0819	0.323

pause. This eliminates changing the header pressures during the burning portion of the cycle and permits a uniform waste gas recirculation rate. Near the end of the twenty-minute cycle a small ring of carbon formation appears near the top of the gas risers of the "on" wall, but this formation disappears completely near the end of the next reversal because of the decarbonizing effect of the waste gas recirculation on the off wall.

Routine inspections of the underjet nozzles and waste gas recirculating ducts are made every six weeks. The operation during the past six months has proven that this inspection should be made at six-week intervals because the nozzle sizes gradually become slightly under size due to a small amount of carbon formation in the nozzle tip. Small particles of carbon break off from the walls of the gas risers on the off decarbonizing cycle.

The waste gas recirculating duct ("dog bone") is provided with an opening extending from the duct through the oven pad. This was incorporated in the design of the ovens so that the duct could be closed off with a silica plug and waste gas mixed with the refinery gas-air mixture externally in the event that carbon formation made it necessary to decarbonize with air on the off cycle, and to provide for the removal of carbon accumulated in the waste gas ducts. It was found that carbon formation in the gas risers did not require decarbonizing with air and that the waste gas recirculation decarbonized effectively; but the opening in the duct facilitates the removal of carbon particles, which are found in small quantities in the waste gas recirculation ducts when burning refinery gas. Evidence of this is first shown by the coke becoming slightly cooler near the coal line.

The gas and air proportioner and regulators are taken out of service for inspection every three months. This is a routine inspection to check the equipment, and make any repairs that might be required. In order to make this inspection, the battery is underfired with coke oven gas for approximately four hours. Since the same underjet nozzles are used on both gases this change over is very simple. The Kemp machine is shut down and the coke oven gas valve is throttled to maintain eight inches water pressure on the bench fuel header. The Askania Regulator is then adjusted to maintain the eight-inch header pressure, and the coke oven gas valve is completely opened. Adjustments are then made to the air boxes in order to obtain the proper combustion.

Changing from coke oven gas to refinery gas is accomplished by closing the coke oven gas valve and permitting the emergency regulator to maintain a pressure on the header. Immediately after the Kemp machine is started and the pressure exceeds six inches water pressure the regulator closes, refinery gas air mixture is supplied for underfiring and the air boxes are adjusted for refinery gas operation. These changes are usually scheduled and are made when the reversing machine is on the pause with all header reversing cocks in the closed position. The refinery gas-air mixture contains approximately forty per cent gas. As the upper limit of inflammability of coke oven gas is calculated to be approximately twenty-six per cent gas in air and that of refinery gas twelve per cent gas in air, the forty per cent mixture is well above the danger point with either gas.

The average stack temperature of the waste gas with both coke oven and refinery gas underfiring is 675° F. This is not excessive for a seventeen and one-half-hour coking rate with twenty-inch ovens. There is no noticeable change in the bench fuel requirements per pound of coal when changing from coke oven gas to refinery gas underfiring.

Application to Other Plants

As the use of oil gas for underfiring has definitely proven advantageous to Philadelphia Electric Company both as regards operating savings and the realization of maximum gas output from existing equipment, the applicability of the system to other locations should be considered. Refinery oil gas is not universally available, but it is probable that after the war appreciable quantities of propane, butane and natural gas will be obtainable in many parts of the country. The operation of underfiring with refinery gas has been so successful that it is our belief any of the gases mentioned above could be used with equal success. In fact, after the Chester battery was converted to refinery gas, propane was used for the heating of an underjet battery at the Henry J. Kaiser Coke Oven Plant at San Bernardino, California.

Presented at American Gas Association Technical Section, Joint Production and Chemical Committee Conference, Hotel Pennsylvania, New York, N. Y., May 24 and 25, 1943.

Dolfini Joins Staff of Norwalk Valve Co.

Andrew Dolfini, who for the past twenty years has represented the Eastern Division of Connelly Iron Sponge and Governor Company as Superintendent has joined the staff of Norwalk Valve Company as production manager in their new plant at 85 Spring Street, South Norwalk, Conn. They are manufacturers of pressure controllers, disc and diaphragm check valves and other control appliances, specializing on vacuum and back pressure combination valves.

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RECENT COURT DECISIONS *Affecting Gas Utilities*

Does Fair Labor Standards Act Affect You?

By
Leo T. Parker
Attorney at Law
Cincinnati, Ohio

CONSIDERABLE discussion has arisen from time to time over the question: When and under what circumstances are gas companies within provisions of the Fair Labor Standards Act?

Since the law on this subject is complicated, and presents variations of employment, we shall review all important higher court cases decided during the past few months. By this method readers may readily apply respective decisions to their individual employment situations.

First, it is important to know that modern higher courts are resolved to *broadly* interpret the Fair Labor Standards Act, whereby many employers who *honestly believe* that their employees are *not* within the provisions of this Federal Wage Law, eventually may find themselves confronted with heavy back-wage allowances, attorney fees, payment of excessive penalties, and other incidental expenses. In other words, gas company officials must be alert and keep abreast with modern higher court decisions because otherwise heavy expenses, loss of valuable time and penalties may result as a consequent of failure to know and abide by the modern wage law.

United States Supreme Court Wage Decisions

Recently, the Supreme Court of the United States rendered several important decisions pertaining to payment by employers of wages specified by the Fair Labor Standards Act. We shall briefly review the new and final law established by these decisions.

In Warren Drilling Company, 63 S.C.R. 125, it was shown that a company owns and operates rotary drilling equipment. It contracts with owners or lessees of land to drill wells to a predetermined depth. When that depth is reached its job is done and its equipment and employees are moved to another location.

Although this contracting company did not own, nor ship, any of the oil, gas, etc., yet the Supreme Court of the United States held that it is obligated to pay wages specified by the Federal Wage Law and, further, that for overtime the contractor must pay time and one-half of the regular wages of $6.50 to $11.00 per eight hour day paid to its employees.

This decision means that although a gas company pays more than the minimum wages it still must pay time and one-half of the exact wages paid to its employees.

Also, it is interesting to observe that the Supreme Court of the United States held that a "pause" or temporary stoppage of goods does not change the interstate commerce character of the transaction.

For illustration, in Walling v. Jacksonville Company, 63 S.C.R. 332, it was shown that a wholesale distributor uses its trucks to haul from depots merchandise intended for distribution to its customers. The company transported the merchandise to its warehouse for checking before delivering same to its customers in the same state.

The Supreme Court of the United States held that this company is engaged in interstate commerce and therefore, required to pay to its employees the minimum wages specified by the Fair Labor Standards Act, although some of the goods shipped into the warehouse were held until orders were received from new customers.

The counsel for the company contended that the pause in the warehouse before the goods were distributed rendered the remainder of the journey of the goods, to customers within the state, purely intrastate commerce transactions. The Supreme Court said:

"A temporary pause in their transit does not mean that they are no longer in 'Commerce' within the meaning of the Act."

On the other hand, in Higgins v. Carr, 63, S.C.R. 337, it was shown that a wholesaler purchased merchandise from outside the state and had it shipped into a warehouse where the goods *remained until sold* to local or intrastate purchasers. The court held this wholesaler not obligated to pay Federal Wages to its employees because this business is purely intrastate transactions.

The important point of the testimony presented by this wholesaler was that he makes *no* sales on commission, nor does he instruct the seller, from whom he purchased the merchandise, to make shipments directly to the wholesaler's customers.

Study of Law

A majority of readers are not familiar with the phraseology of the Fair Labor Standards Act, and we shall review its clauses and provisions.

The United States Department of Labor Interpretative Bulletin No. 1, at pp. 4 and 5, reads as follows: "The second category of workers included, those engaged 'in the production of goods for interstate commerce,' applies, typically but not exclusively to that large group of employees engaged in manufacturing, processing, or distributing plants, a part of whose goods moves in commerce out of the state in which the plant is located."

The explanations continue, as follows: "This is not limited merely to employees who are engaged in actual physical work on the product itself, because by express definition in section 3 (j) an employee is deemed to have been engaged in the production of goods, if such employee was employed in *producing, manufacturing,*

mining, handling, transporting, or in any other manner working on such goods, or in any process or occupation necessary to the production thereof, in any state."

Therefore, the benefits of Federal Wage Law are extended to such employes as maintenance workers, watchmen, clerks, stenographers, messengers, all of whom must be considered as engaged in processes or occupations "Necessary to the production of goods." This law is particularly applicable to gas companies producing or selling gas for distribution in the United States.

Intrastate Per Cent

Another phase of this law often presented gas corporation officials and, ***until recently,*** not decided by a higher court is: Is an employee who is employed to perform less than fifty per cent of his duties as an interstate worker within the control of the National Wage Act?

A majority of gas company officials believe that, from an interpretation of the Administrator's explanation, an employee who only occasionally works on interstate jobs is *not* actually "an interstate worker." Therefore, the new decision of Hart v. Gregory, 10 S.E. (2d) 644, is unusually important.

The facts of this case are that an employee was hired as a night watchman and, also, to keep the boilers filled with water. It was necessary that these boilers be kept full of water during the night time, otherwise the boilers would dry up and ruin. He sued the company to recover $1,153, the difference between the wages he actually had received and the wages he should have received under the Fair Labor Standards Act. Although the lower court refused to hold the employer liable the higher court reversed this verdict, and said:

"The argument that the percentages between interstate and intrastate commerce in the distribution of goods is a material consideration is held futile. ... It is plain that the provision *cannot* be applied by a mere reference to percentages and the fact that (employer's) sales in interstate commerce amounted to only 37 per cent and not more than 50 per cent cannot be deemed controlling."

In other words, according to this decision, the important consideration, when determining whether an employee comes within the provisions of the Federal Wage Law is: Is the work performed by the employee *necessary* and useful to conduction of the employer's *interstate* business? If so, the employee is within the provisions of this law, although he may perform a large percentage of his work in intrastate duties.

Also, see Fleming v. Lowell Company, 30 Fed. Supp. 320. In this case the court held that a company was engaged in "interstate commerce" and subject to the Fair Labor Standards Act *even though more than 98 per cent of its total business was intrastate business.*

What Employes Included?

When interpreting the Fair Labor Standards Act the higher courts hold that "Commerce" means trade, commerce, transportation, transmission, or communication among the several States or from any State to any place outside thereof. "Goods" means goods, wares, products, commodities, merchandise, or articles or subjects of commerce of any character, or any part or ingredient thereof. "Produced" means produced, manufactured, mined, handled, or in any other manner worked on in any State. For the purposes of this Wage Law an employee shall be deemed to have been engaged in the production of goods if such employee was employed in producing, manufacturing, mining, handling, transporting, or in any other manner working on such goods, or in any process or occupation necessary to the production thereof, in any State.

Therefore, it is quite apparent that the Fair Labor Standards Act is broad and includes all employees who handle goods, as gas, intended for interstate commerce.

Also, the fact that an employee is hired to perform work in a gas company office building, warehouse, or other place, where interstate commerce business is transacted, does not result in this employee being within the jurisdiction of the Fair Labor Standards Act.

For example, in Johnson v. Great Nat. Company, 166 S.W. (2d) 935, Texas, it was disclosed that an employee was employed by a corporation which owned an office building where persons and firms rented space and transacted interstate commerce business. This employee sued the corporation to compel payment of back wages under the Fair Labor Standards Act. The higher court held the employee not entitled to a recovery, and said:

"We are unable to relate how an employer could be engaged in commerce when he only produced a means to produce money under rental contracts—a service establishment, for the convenience and hire of tenants. In the case at bar, no goods were produced, manufactured, mined, handled, or in any manner worked on or processed in the building."

Therefore, in view of this new decision it is well established law that no employee is affected by the Federal Wage Law unless the employer is "engaged in commerce or in the production of goods for commerce," or engaged "in any process or occupation necessary to the production thereof."

The Fair Labor Standards Act provides that minimum wages specified are not applicable to bona fide executives. The question in the minds of many plant owners is: Who is an executive?

In Zaetz v. Corporation, 30 Atl. (2d) 504, it was shown that an employee regularly directed the work of other employees. He offered suggestions as to hiring, firing, and change of status of other employees. He exercised discretionary powers, and was compensated on salary basis at more than $30 per week. He sued his employer to recover time and one-half for overtime over a period of several months. The higher court refused to hold the employer liable, although this employee performed *some* ordinary work.

This higher court held that a "working" foreman is not an executive. Therefore, a working foreman must be paid wages specified by the Fair Labor Standards Act, but he must definitely prove the exact hours he worked over his regular hours.

When Night Watchman Is Interstate Employe

Considerable discussion has arisen from time to time over the exact circumstances which result in a night watchman being an interstate employee and within the provisions of the Fair Labor Standards Act. It is important to know that a person engaged exclusively in guarding a plant *shut down at night time* is not an interstate employee.

For illustration, in Southern Corporation v. Walton, 11 So. (2d) 912, it was shown that a night watchman performed no service other than making hourly rounds of the plant at night. The question presented the court was whether he was engaged in "production of goods for commerce" or in an occupation "necessary to the production of goods for commerce" within the Fair Labor Standards Act.

The testimony disclosed that the plant did not operate at night during the period of the watchman's employment; that the corporation was not engaged at night in the production of goods for interstate commerce while

he was on duty; and that when fires were kept under the boilers in the plant at night, it was done by a fireman kept on duty for that purpose, and that when repairs were made occasionally at night to the machinery, such work was done by employees other than the watchman.

In view of these facts the higher court held the watchman not within the Fair Labor Standards Act. The court said:

"Presumably the night watchman slept during the daytime, while the other employes were engaged in the production of the goods for commerce. He contributed nothing to such work of production, nor to enable those engaged in production to more efficiently perform their duties. No more goods were produced by reason of his employment, and he would no doubt have been kept on duty for the purpose for which he was employed even if it had been necessary to close down the plant. If the plant had been running at night, the services of a night watchman would not have been required at all, even to satisfy the request of the insurance company."

On the other hand, see the case of Doyle v. Johnson Bros., 28 N.Y.S. (2d) 452. This court held that a night watchman, whose duties were to guard merchandise of his employer, engaged in interstate commerce, and to open gates of the yard to permit passage of his employer's trucks, and to act as fireman tending a furnace to keep the plant properly heated, was "engaged in production of goods for interstate commerce" within the meaning of the Fair Labor Standards Act.

Also, in Milam, 157 S.W. (2d) 653, it was shown that a night watchman guarded premises on which products sold in interstate commerce were manufactured. Occasionally he took telephone orders, and telephone calls after business hours. The higher court held this watchman engaged in interstate commerce.

Thus it will be seen that in all of these cases a recovery was permitted under the Fair Labor Standards Act in favor of night watchmen who were engaged in *other* and varied activities which were at least indirectly connected with production of merchandise.

Also, a recovery of wages under the Fair Labor Standards Act has been allowed in other cases where it was the duty of the night watchman to guard the materials intended for interstate commerce while stored on the premises or in the plants, or when loaded in freight cars or otherwise awaiting shipment. See, Robinson and Company v. Larue, 1941, 178 Tenn. 197.

Applied To Injury Case

According to a late higher court decision the Fair Labor Standards Act permits truck drivers to work sixty hours each week without being subject to payment of the minimum compensation for injuries specified by the law.

For instance, in Town of Winnfield v. Jackson, 10 So. (2d) 655, it was shown that a motor truck driver was seriously injured while attending to his regular duties. It is conceded that the driver was paid compensation for a period of thirteen weeks at the rate of $9.60 per week, or a total of $124.80. The driver contended, however, that in view of the applicability of the Fair Labor Standards Act of 1938, he was entitled to a minimum of $20 per week during said thirteen week period.

However, since the driver averaged working only 58 hours a week the higher court refused to hold the driver entitled to recover a minimum compensation of $20 a week, and said:

"An employer, though engaged in interstate commerce, was authorized to work "pick-up" or "local" drivers as much as sixty hours per week, without being subjected to the overtime and minimum wage schedule of the statute. It has been amply shown that plaintiff's work-week with defendant did not exceed fifty-eight hours per week and, therefore, his employment, as to hours and pay, falls within the permissive authority of the statute (Fair Labor Standards Act)."

Social Security Lien Valid

Failure of a gas company to pay Social Security, Unemployment, or Compensation insurance taxes may result in its real property being sold to recover the taxes, and penalties. Furthermore, it makes no difference whether or not the property is in the same county where the corporation operates his business.

For example, in Commonwealth v. Reinhart Company, 167 S.W. (2d) 817, the question presented the court was: Can a state enforce collection of a lien for social security taxes against realty situated in another county from that where the owner and employer has his principal place of business?

In holding in the affirmative, the higher court said:

"The sole question is whether the Commonwealth may assert and enforce by proceedings in the Franklin Circuit Court a lien against real estate, situated in another county, for taxes allegedly due by a taxpayer residing and served with summons in such other county.... The question can only be answered in the affirmative."

Labor Law Void

It is well known that the law recognizes the right of the trades, crafts, guilds, and arts, whether composed of skilled or unskilled workmen, to organize and invite others to join them. When organized, they may use the organization to promote their social, civic, and economic betterment, among other things, that of securing as much as they can for their labor. Employers may also organize for similar purposes and for the purpose of securing the best possible return on their capital. Every other profession and business may organize for like purposes, but when organized, the law recognizes no distinctions among them but all must conform alike to its decrees and mandates.

For example, in Pittman v. Nix, 11 So. (2d) 791, it was disclosed that a city enacted an ordinance prohibiting organization of labor unions, solicitation of members, and solicitation of membership fees as a prerequisite for joining a union. In holding this ordinance void, the higher court said:

"Our conclusion is that the ordinance in question is contrary to fundamental legal and constitutional principles."

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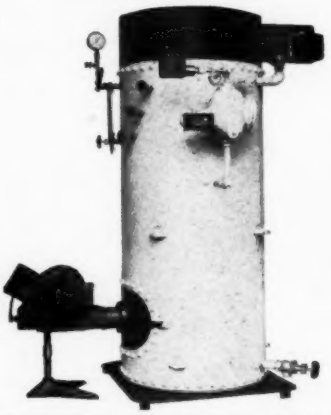

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Laclede Gas Light Co. Speeds Customer Service

By JAMES E. KEARNS

RIGHT NOW, while people are confused by the complexities of domestic life and the anxieties of the War, public utilities have the best opportunity ever presented to form lasting friendships and establish good will, according to Elmer L. Ramsey, Manager of Customer Relations for The Laclede Gas Light Company of St. Louis.

As a result of the War and the shortage of competent help, people are becomihg more and more aware of the value of proper service and courtesy. In most places they are not getting it. Businesses have accepted these conditions as something that must be tolerated and therefore have adopted an attitude of resignation. Those businesses that give ear now to the wants of customers will profit most when the reconstruction period arrives.

In Mr. Ramsey's opinion, companies that have sought to gain friendships suddenly at a moment of need, have had poor success, but that companies that have worked for friendships continuously have kept them and benefitted from them. Companies, therefore, that wish to enjoy the friendly regard and confidence of the public in the period of readjustment must cultivate it NOW with all speed.

In spite of shortage of competent help and the necessary training required, Mr. Ramsey believes something can be done about improving service. One example is the new plan recently adopted in the Customers Advisers Department of Laclede for increasing the efficiency of handling customer contacts.

The enunciator is fastened to the wall in front of the receptionist. The white arrow, activated by a buzzer on the Adviser's desks indicates to the receptionist the Advisers who are available for customers.

View of the Customers Advisers Department, located on the mezzanine of the main office building, showing the receptionist and the fourteen Advisers' desks.

This department was completely reorganized several years ago, and the system of handling customers was greatly improved at that time.

Interviewers called Customer Advisers were installed at separate desks with a special telephone system direct to the Customers Accounting Department. Customers could be served for the most part without the interviewer having to leave his desk.

Until a few weeks ago, a floorman on duty greeted the customer, ascertained his wants and directed him to an Adviser. He indicated the proper desk to the customer by pointing or by some such designation as—"third desk to the right, or second on the left." Under this system it was difficult for the floorman to keep a correct check on which Adviser was available and which was not.

Under the new system, the customers are greeted by a receptionist

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who sits in front of the fourteen Advisers' desks, which are placed at an angle and designated by a number, which can clearly be seen by the customer.

An electric enunciator is suspended from the ceiling directly in front of the receptionist.

When a customer first makes inquiry, the receptionist takes his name and indicates the number of the desk to which he is assigned. In this manner, customers are assigned in proper order. The Advisers keep the receptionist constantly posted as to their availability by means of the enunciator. When an Adviser has finished with a customer, he presses a button on his desk which activates a tiny white arrow on the enunciator box, opposite a number corresponding to the number on his desk and an accompanying buzzer attracts the attention of the receptionist. She checks her lists, and the customer is dispatched to that desk. The receptionist then presses a button at her desk which releases the arrow indicator, so that it will be free for the next signal.

The new method has been in effect a little over a month and has been instrumental in making it possible for the faster and more efficient handling of customers.

In addition to the record kept by the receptionist, each Adviser has a daily record sheet, on which is indicated the nature of the call, whether "turn on," "cut-off," "high bill complaint," etc. The time of the interview is also indicated on this sheet, which is turned in at the end of each day. Thus a perfect record of all customer calls is kept, from which monthly reports are compiled and supplied to the executives of the company.

"We've found that all customers appreciate the facility of this system," Mr. Ramsey says. "Some even take time out to report to the management on the courtesy and tact with which their requests have been handled. Naturally, we spent a lot of time training our customer contact employees. The result of prompt and courteous treatment of a customer by an employee may not always be evident, but in the subconscious mind of the customer there is a feeling that he, although reluctant in admitting it, was treated right. If he does nothing more than keep it to himself, the company has won."

U.G.I. Announces Organization Changes

The Board of Directors of The United Gas Improvement Company, at an adjourned meeting held June 16th, declared effective the Company's Plan for divestment of certain securities and other assets approved by order of the Securities and Exchange Commission, March 18, 1943, which order required the Company to take such action within 90 days after the entry thereof.

In brief, the plan provides for the retirement of the Company's outstanding $5 Dividend Preferred Stock, each share to receive in exchange 3 shares of new $1 Dividend Preference Common Stock of Philadelphia Electric Company and $40 cash, and the distribution to the holders of Common Stock of U.G.I. of 1/3rd of a share of new Common Stock of Philadelphia Electric and 1/12th of a share of Common Stock of Public Service Corporation of New Jersey for each share of Common Stock held, without surrender of the outstanding shares of U.G.I. Common Stock. The Board fixed June 11 and June 15, 1943, respectively, as the record dates for determination of holders of Preferred and Common Stock entitled to receive these distributions.

In connection with making effective the Company's plan, certain organizational changes were made. Messrs. Horace P. Liversidge, Harold S. Schutt, and Charles E. Brinley, who are also Direcors of Philadelphia Electric Company, resigned as Directors of U.G.I., and Messrs. Wm. W. Bodine, President, and Walter E. Long, Vice-President of U.G.I., resigned as Directors of Philadelphia Electric Company, eliminating the common officers and Directors of the two companies. The U.G.I. Board adopted new By-Laws providing for a reduction in the number of Directors from 11 to 9. Mr. Long and Mr. John A. Frick, President of Allentown-Bethlehem Gas Company (a U.G.I. subsidiary), were elected Directors of U.G.I.

John E. Zimmermann, former Chairman of the Board, having died on May 30, 1943, the Company's By-Laws were changed abolishing the position of Chairman of the Board and providing that the President shall be the Chief Executive Officer in charge of the business and affairs of the Company.

Mr. Bodine resigned as President, remaining as a Director, and was elected Chairman of the Executive Committee. Mr. Long was elected President of the Company. Both of these changes are to be effective September 1, 1943.

Mr. Long has been associated with the utility industry since 1904, at which time he entered the employ of The Philadelphia Electric Company. He was advanced to the position of controller and later was elected a Vice-President of that Company. In 1928, when U.G.I. acquired control of Philadelphia Electric Company, Mr. Long became a Vice-President of U.G.I., which office he has held since that time. He is also a Director and officer of U.G.I. subsidiary companies, and is a past President of the Pennsylvania Electric Association.

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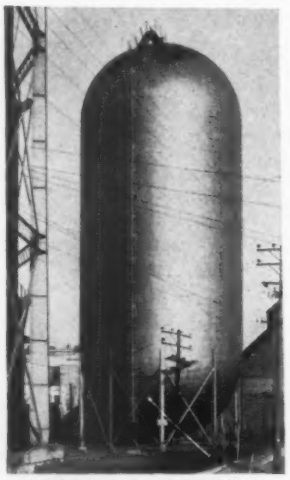
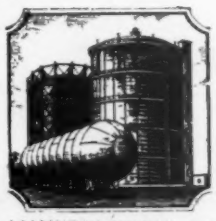
Also a Gas Holder Inspection Service by our corps of trained inspection engineers which will keep your holders in efficient operation. Details of this service will interest you.



400,000 cu. ft. All Welded Pressure Tank



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Gas Construction Company

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MANUFACTURERS OF: Stacey-Klonne Dry Gas Holders. Telescopic Gas Holders. Stacey "Bullets", Vertical or Horizontal. Also Shop Assembled and Field Erected Steel Alloy and Aluminum Structures in Welded and Riveted Construction.

News of the Gas Industry

P.C.G.A. Measurement Conference

The Pacific Coast Gas Association Measurement Conference was held May 19-20 at Los Angeles; Harry A. Faull, Southern Counties Gas Co. was Chairman.

Mr. Faull read a paper on the subject "Meter Accuracy Records and Their Analysis," and Otto Goldkamp read a paper titled "Gummy Deposits in Gas Meters" in which he pointed out that, due to the size of samples obtainable, these gummy deposits defy analysis by ordinary laboratory methods.

In the discussion of this subject it was brought out that the effect of gums on meter valves was a slow proof, and, when gums are present, valve seat area, weight of valve cover, and valve cover material, all are important factors in determining the degree of slow proof.

D. E. Farmer, Portland Gas and Coke Co. described how tinned case meter fronts or backs which have been dented or caved in may be restored to usable condition by means of an inexpensive form made of cement. A new front or back meter section is placed in a box of freshly made Portland cement. When the cement hardens, removal of the meter part leaves a form into which a damaged front or back may be placed and hammered out with a hard rubber mallet. After some experimenting, quite acceptable fronts or backs may be salvaged from damaged parts which might otherwise have been discarded.

Some of the unannounced subjects discussed at the meeting were the following:

Orifice Meter Chart Integrator

Messrs. Kennedy and Cortelyou, of Southern California Gas Company, reported on their experiences with the integrator. They report very satisfactory results, particularly from the labor-saving standpoint. One point made was that, to the end of mitigating operator fatigue, they had found it desirable to alternate operators on about a two hour schedule.

Mr. Cortelyou also told of an incomplete investigation that he is conducting in an effort to determine the percent error incurred, as the result of variations in pressure, when a square root planimeter is used in the computation of orifice meter charts. At this point, it appears that his investigation will result in a very simple and useful curve for making this determination.

Solder

Supplementary Order M-43-b, and revisions, and its effect on meter shop operations, was reviewed and discussed.

It was the consensus of the companies repairing large numbers of tin meters that they could continue the activity for several years without having to purchase new solder, by careful reclamation and use.

The possibility of gaining solder by leaving back plates out of repaired tin meters was discussed. The opinion was that if a suitable means can be developed for housing the meter index, from the inside of the meter, that uses less solder than is saved by leaving out the back plate, that this would be an entirely feasible plan.

Methods of cleaning reclaimed solder were discussed.

Parkerizing Orifice Meter Gage Chambers

Mr. T. K. M. Smith of Pacific Lighting described this treatment of orifice meter gages. It puts a thin film of material on the walls of the mercury chambers, and the result is a wall surface that gives a convex meniscus even though the mercury be quite dirty. It has been very effective in locations where the mercury unavoidably becomes dirty.

After luncheon on Thursday, at which the group were guests of George Stevenson—American Meter Company, E. H. Roseberry—Sprague Meter Company, J. J. Delaney— Reliance Regulator Company, and E. H. Adams—Pittsburgh Equitable Meter Company, an interesting trip was made through the Henry J. Kaiser steel mill at Fontana.

Owens Commissioned in Naval Service

George F. B. Owens, assistant vice president of The Brooklyn Union Gas Company, has been commissioned a lieutenant commander in the Naval Reserve. He reported June 5th to the commandant of the 12th Naval District in San Francisco.

G. F. B. Owens

He attended the U. S. Naval Academy at Annapolis, but in his senior year transferred to the Massachusetts Institute of Technology for a course in electrical engineering. He was graduated with a B.S. degree in 1921 and an M.S. degree in 1922.

He has been associated with Brooklyn Union since 1930. He was elected an officer in 1939.

Mr. Owens was the 660th employee of the Brooklyn utility to enter the armed services.

Lincoln Foundation Award Studies to be Published in Book Form

New information on arc welding of great interest and value in war production and with many extremely important peacetime applications is soon to be made available by The James F. Lincoln Arc Welding Foundation in the form of a 1200-page book containing 98 of the outstanding award studies submitted in the Foundation's 1940-1942 Industrial Progress Award Program, according to announcement made by the Foundation recently.

This timely volume, entitled, "Studies in Arc Welding," will make available the accumulated knowledge and experience of more than 100 engineers, designers and others applying themselves individually to a specific design study involving arc welded construction.

While the vast majority of the studies to be published involve products of plants engaged in war production, the principles and practices reported in the individual papers will be of inestimable value in postwar uses of the arc welding process.

In selecting the papers for inclusion in the book, the editors carefully considered the subject matter of all of the 408 papers for which the authors received awards. Final selection of the papers to be included took into account originality and the extent to which the particular paper would contribute to the literature on welding. The object was to avoid duplication of subject matter and at the same time compile a volume which would be as comprehensive as possible in scope.

The 98 papers are virtually all to be reproduced in complete form. In a relatively few instances, more lengthy papers must of necessity be included as comprehensive briefs. In no instance is material omitted, either in text or illustration, which is pertinent to complete treatment of the subject matter. The number of illustrations including both photos and line drawings, is expected to exceed 900.

"Studies in Arc Welding" is being edited by A. F. Davis, secretary, and Ed C. Powers, assistant secretary of the Foundation.

Institute of Gas Technology Announces New Trustees

H. L. Farrar, president of the Coast Counties Gas and Electric Company in San Francisco, Calif., has been named to the Board of Trustees of the Institue of Gas Technology at Illinois Institute of Technology.

Announcement of his election was made by Harold Vagtborg, director of the Gas Institute, following a meeting of the board on May 27.

Mr. Farrar is the only new member of the Board of Trustees. He replaces A. R. Bailey, formerly assistant to Mr. Farrar at the Coast Counties Company who is now in the armed forces.

All officers of the Institute of Gas Technology were reelected at the meeting. They include: Frank C. Smith, president of the Houston Natural Gas Corporation, chairman; Henry T. Heald, president of Illinois Tech, president; Mr. Vagtborg, director; Robert B. Harper, vice-president of the Peoples Gas Light and Coke Company, secretary; and Raymond J. Spaeth, treasurer of Illinois Tech, treasurer.

Trustees for the term expiring in 1943 —one-third of the members of the board —came up for re-election at the annual meeting.

Those re-elected for another three-year term include: W. Alton Jones, president of the Cities Service Company; Alfred O. Kauffmann, retired president of the Link-Belt Company; Frank H. Lerch, Jr., president of Gas Companies, Inc.; Clifford E. Paige, president of the Brooklyn Union Gas Company; Louis Ruthenberg, president of Servel, Inc.; and Wilfred Sykes, president of the Inland Steel Company.

Ridge Tool Company Occupies Modern Plant

The Ridge Tool Company, Elyria, Ohio, has recently moved from its original factory site at North Ridgeville into completely remodeled and modernized plant and offices in the city of Elyria. Increased business of the makers of Ridgid Pipe Tools has for some time made expansion of manufacturing facilities necessary; plans have been sped up in the past few months because of increased jobber and war orders. The new factory provides five times the working space of the old and permits greater manufacturing efficiency. A feature of the new offices is an attractive mural 22 feet long by 3 feet deep in the reception room, painted by Glenn Shaw of the Cleveland School of Art; it depicts the uses of Ridgid pipe wrenches, threaders, cutters and vises in many industries. The Ridge Tool Company is twenty years old this year.

Pres. Mallon of Dresser Co. Announces New Executives

H. N. Mallon, president of Dresser Manufacturing Company, has announced the election of Norman Chandler, of Los Angeles, as a member of the company's board of directors, and of R. E. Reimer, of Bradford, Pa., as secretary and treasurer.

Mr. Chandler is president and general manager of the Los Angeles Times and secretary of the American Newspaper Publishers Association. He is also a director of Pacific Pump Works, of Huntington Park, Calif., one of Dresser's subsidiaries.

Mr. Reimer has been with the company since January, 1929, and has been treasurer since May, 1932. His election to the additional office of secretary fills a vacancy caused by the death of Merrill N. Davis.

Personnel Changes in Cooper-Bessemer Corp.

The Cooper-Bessemer Corp., Mt. Vernon, Ohio, announce the following promotions in their organization.

Carl H. Vaupel has been appointed to the position of assistant general manager, applicable to the company's two plants, one at their Mount Vernon, Ohio headquarters and the other at Grove City, Pa. Since joining Cooper-Bessemer early in 1941, Mr. Vaupel has been devoting the major portion of his time to various managerial duties at the company's Grove City, Pa., plant where production is concentrated mainly on large Diesel engines for the Navy, Coast Guard, and Maritime Commission.

Willard A. Luli, engineer for the past eight years, has been promoted to the post of Factory Production Representative for the company's two plants at Mount Vernon, Ohio and Grove City, Pa.

R. S. Warren, who joined The Corporation eight months ago as assistant advertising manager, has been promoted to the position of sales promotion manager. For seven years before joining Cooper-Bessemer, Mr. Warren was in charge of advertising and sales promotion for Invincible Manufacturing Company of Dover, Ohio, producers of industrial suction cleaning equipment and turbo-blowers.

George Johnstone, Jr., formerly assistant foundry superintendent at the Grove City, Pa. plant, has been promoted to the position of foundry superintendent.

Hirsh Becomes V.P. of Laclede Gas Light Co.

The Board of Directors of The Laclede Gas Light Company elected Alfred Hirsh as Vice-President of that organization in a meeting held May 27.

Alfred Hirsh

Mr. Hirsh started with Laclede as an office boy in 1908 at the age of fifteen. He continued his studies in night school at St. Louis University and three years later was made Secretary to the President. He later was made assistant secretary of the company and in 1938, was appointed Assistant to President L. Wade Childress. In 1941, he was named General Superintendent and his capabilities in handling the duties of that office won him the promotion to Vice-President.

Mr. Hirsh is a native St. Louisan and has an unbroken service record with Laslede.

Chemical Exposition

The 19th Exposition of Chemical Industries will be held the week of December 6th to 11th. The long series of exhibitions, held biennially, dates back to 1915.

Madison Square Garden, New York will be the scene of the event instead of Grand Central Palace due to the fact that the U. S. Army has commandeered the exposition floors of the Palace as an induction center.

Industrial exhibitions of the character of the Chemical Exposition have proven most helpful in the war effort in many ways. Exhibitors welcome it also as an aid in post-war selling and distribution of their products which will be available when their war efforts have terminated.

A diagram of floor plans is now available through the International Exposition Company, 480 Lexington Avenue, New York City.

Twenty-two foot mural at offices of Ridge Tool Company.

Government Seeks Business and Industry Analysts

More and more critical positions in the Government service are being vacated by men drawn into the armed services. Qualified persons must be recruited to replace these men.

Persons are desired who have had executive experience (involving analysis) in business or industry as distributors or manufacturers of such commodities as foods, textiles, metals, consumer goods, or industrial equipment. Specialization may have been in sales management, factory management, procurement, market analysis, traffic management, or expediting of production.

Men are needed to make analyses with regard to distribution and production; to analyze the needs for and the supply of critical materials, consumer goods, and industrial commodities; to survey the availability of productive capacity, materials, or commodities, and the possibilities of substitution; to work out, after consulting with government agencies and business organizations, balances between requirements and supply.

The positions pay from $2,433 to $7,128; however, few appointments will be made to positions paying $5,228 and over. There are no age limits for this examination and no written tests.

Further information and application forms may be obtained at first- and second-class post offices, Civil Service Regional Offices, and the Commission in Washington, D. C.

A.G.A. Expands Program of Domestic Gas Research

The A. G. A. program of fundamental research in the utilization of gas for domestic purposes is being greatly expanded through recent action of the Executive Board according to an announcement by Everett J. Boothby, Chairman, Committee on Domestic Gas Research.

The basic conception of A. G. A. Domestic Gas Research has been developed by the Research Committee over a period of several years through the assistance of a Technical Advisory Committee for each of the basic projects. These technical advisory committees are composed of utility and appliance manufacturing engineers and executives. From this basic conception has been developed comprehensive detailed working outlines for each section of projects in cooking, water heating, central space heating, direct space heating and atmospheric burners.

Under the new authority granted by the Executive Board the cooking, water heating, central space heating and atmospheric burner research projects will be concentrated on for the balance of the year.

This extensive domestic gas research program is designed to overcome fundamental technical problems that limit the optimum application of gas in the home, and to provide the soundest possible technical foundation on which gas appliances of the future will be designed and built. These fundamentals consist of improved and new methods of combustion and improvement in the different possible methods of transmitting heat to cooking vessels, to hot water for domestic service and to steam, water and air for househeating systems. They further consist of fundamental studies of new and improved methods of ignition, heat distribution, venting, etc., and the elimination of all noises of combustion, as well as other noises in appliances.

The working outlines of this expanded and accelerated domestic program of fundamental research have been laid out in detail for a period extending more than a year beyond the actual current laboratory work. These working outlines are changed from time to time by the Research Committee as work advances, the changes made being largely the results of continuing studies by the individual Technical Advisory Committees.

Eastern Gas & Fuel Associates Announce Promotions

Promotion of three officials is announced by Halfdan Lee, president of Eastern Gas and Fuel Associates of Boston.

W. H. Earle, vice president, Philadelphia Coke Co., Philadelphia, has been elected president.

Hugh MacArthur, vice president, The Connecticut Coke Company, New Haven, Conn., has been elected president.

Both companies are subsidiaries of Eastern Gas and Fuel Associates.

H. B. Baird, vice president of Eastern Gas and Fuel in charge of sales for its Koppers Coal Division, has been elected a trustee of Eastern Gas and Fuel. He will continue in his present position.

Mr. Earle and Mr. MacArthur succeed Angus MacArthur, deceased, who was president of Philadelphia Coke and Connecticut Coke.

Annual Meeting of the A.G.A.E.M.

The annual meeting of the Association of Gas Appliance and Equipment Manufacturers was held June 29th at the Waldorf Astoria Hotel, New York, and was presided over by Col. W. F. Rockwell, President.

Col. W. F. Rockwell

The nominating committee, F. H. Adams, Chairman, recommended that the present officers be re-elected for another year. Their re-election was voted.

F. H. Adams addressed the meeting on the subject "Should the A.G.A. Laboratory Undertake Applied Research during the War?" Hall Henry, Chairman of a sub-committee of the A.G.A. Post-War Planning Committee, addressed the meeting on the subject "Our Joint Post-War Problems."

Col. Rockwell urged the members to keep in close touch with Mr. Macomber, Washington representative of the Association, who is in close touch with the government departments.

The afternoon was devoted to meetings of the various divisions of the Association, who discussed problems of particular interest to their branch of the industry.

The meeting was held just as this issue of the JOURNAL was going to press, and further details will appear in a later issue.

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PIPE
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PURIFICATION IS THE OUTPOST OF SMOOTH GAS PLANT OPERATION. GUARD THAT OUTPOST WITH THE OXIDE THAT IS THE PROVEN STANDARD FOR THE INDUSTRY.

GPM

GAS PURIFYING MATERIALS CO., INC.
Long Island City 2, N. Y.

John Bogan Joins Cribben & Sexton Company

G. D. Wilkinson, President of the Cribben & Sexton Company, Chicago, Ill., announced June 9th that John E. Bogan had been appointed General Sales Manager and War Contract Coordinator of the Cribben & Sexton Company.

Bogan, formerly Director of Sales Promotion and Advertising for the Association of Gas Appliance & Equipment Manufacturers, left the utility merchandising field in 1939 to become National Sales Counsellor of A.G.A.E.M., and was promoted to Sales Promotion and Advertising Director in 1940.

John E. Bogan

Bogan is considered one of the outstanding appliance promotion and merchandising names in the industry and is one of private industry's topnotch platform speakers. Demands for his public speaking and merchandising talents have carried him into every state in the country and Canada, to address conventions, Chambers of Commerce, sales and advertising groups, etc.

His specialized merchandising and sales techniques gave rise in merchandising circles to the word, "Boganalysis" as a means of describing his ability of analyzing and remedying unprofitable appliance operations.

Two years ago, the CP Range Portfolio entitled, "Once Upon a Time," produced under his direction, won the International Direct Mail Advertising Award.

The complete facilities and plant of the Cribben & Sexton Company is now engaged in munitions and war work. Bogan, when asked what the nature of his duties were to be, answered: "I have gone to work in a war plant. Universal's sales and promotion will come in due and right time, and in proper proportion—to assure gas cooking its rightful place in the post-war pattern of America's design for better living."

West Virginia Geological Survey to Release Important Publications

Two reports will be released soon by the State Geological Survey. They are: "Summarized Deep Well Records In West Virginia," by Riotz C. Tucker, and the "Devonian System," by Herbert P. Woodward.

The current request from the office of the Petroleum Administrator for an increase in the production of oil and gas makes "Summarized Deep Well Records In West Virginia," by R. C. Tucker especially timely, for deep well drilling is probably the most important method of finding new oil and gas reserves in West Virginia. This report, accompanied by a map on which all the deep wells in the State are located, summarizes records of some 1600 wells in West Virginia and immediate bordering areas that have been drilled to the Onondaga lime or deeper.

Because of the discovery of large gas reserves in the lower members of the Devonian, the report on the "Devonian System of West Virginia," by Herbert P. Woodward is of great interest and importance to the oil and gas industry. This represents the second of a series recently initiated on the rock systems of the State. Reports of this nature, while essentially basic in character, provide the foundation without which economic problems can not be solved. This volume contains data pertinent to the Devonian rocks, description of each formation, its general character, thickness, distribution, correlation, and nomenclature. It also comments on each exposure of Devonian Rocks that is of special geologic or economic interest.

New Gas Range Oven Dehydration Kit

The Estate Stove Co., Hamilton, O., is presenting a war time service to Victory gardeners by putting out "The Estate Oven Dehydrating Kit" for the drying of foods in any standard gas range oven, and is described and illustrated in a two color circular recently issued. It describes how fresh picked fruits and vegetables are prepared for dehydration and a booklet of complete directions is included in each kit. The kit contains all of the items shown in the illustration, except the fruit.

Dehydration Kit for use with standard gas ranges.

CLEVELAND

"A" TYPE METERS
"B" TYPE METERS
DIAPHRAGMS

Cleveland Gas Meter Co.

2180 East 65th St., Cleveland, Ohio ESTABLISHED 1895

CHEMICAL TABLES

A Handbook of selected subjects from the Handbook of Chemistry & Physics 1938 Edition.

Subjects covered include Mathematical Tables; Properties and Physical Constants of Organic and Inorganic Compounds; General Chemical Tables; Specific Gravity and Properties of Matter; Heat and Hygrometry; Electricity; Light; Quantities and Units. Also other miscellaneous subjects.

Sectionally arranged with a complete index. Size 5" x 7¼", 1390 pages, flexible leatherette cover.

$1.00 a copy postpaid — American Gas Journal, 53 Park Place, New York

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Effects of War

(Continued from page 23)

deal of attention to post-war planning on technical, commercial, industrial, in fact on all fronts.

Government Controls

A word of explanation. The British Gas Federation is composed of a voluntary membership which includes about all the gas organizations of the country.

The Minister of Fuel & Power recently told the Chairman of the Federation that it is vitally important for the Gas Industry to formulate its plans for the future NOW, and that a plan should be submitted within six months, otherwise the Government itself will undertake such a plan. The British Gas Federation has appointed a "Fact Finding Committee" which, no doubt, will study such matters as grouping, amalgamation, holding companies, location and ownership of plants, quantitative surveys, density of demand, position of coke ovens, capacity of existing plants, standards of service to consumers, by-product disposal, prices charged in various parts of the country, etc. You will see what a colossal task this is in but six months, but "orders is orders."

A Seeing Eye

(Continued from page 18)

ible with 40 to 60 feet between the periscope and light. Within these ranges, small foreign objects, the original marks of pipe rolling, metal and slag deposits on the inside of welded joints, etc., stand out in surprising detail. When bends are inspected, the units have been attached at points 10 feet on each side of the bend. By interchanging periscope and light and looking into the bend from two directions, there is sufficient light intensity to inspect for stoppage deposits. If more detailed inspection of a bend is required, a third insertion point is provided in the bend.

WANTED

Gas Holders, Pumps, Condensers, Coolers, Tanks, Boilers, Buildings, Pipe, etc.

Jos. Greenspon's Son Pipe Corp.
National Stock Yards (St. Clair County) Illinois

WANTED

New items for manufacture. Prominent manufacturer with national distribution is interested in securing additional products to manufacture and sell, (preferably gas appliances) now and/or after Victory. Address Box 128, c/o American Gas Journal, 53 Park Place, New York, 7, New York.

Pacific Coast Assn. Institutes Program of Frequent Committee Meetings

In step with the pace of war production, the Pacific Coast Gas Association is substituting, in place of its regular annual convention, frequent and compact invitational committee meetings, according to Clifford Johnstone, managing director.

Some of the subjects already discussed from the standpoint of experience and ideas include: Manpower, Priorities, Dehydration of Vegetables, Nutrition (Home Service), Utilization, Accounting, Dealer Cooperation, Production and a report to the Office of Civilian Defense on Dim-out cooperation.

These meetings, Johnstone says, are subject to call, upon short notice, to discuss wartime problems as they arise, and are designed not only to aid members in meeting these problems, but also to assure full and prompt cooperation with government agencies on vital war projects.

Book Review

Gas Chemists' Book of Standards for Light Oil and Light Oil Products, by V. J. Altieri, 1943, American Gas Association, Inc., New York, N. Y. 365 pages. Price $3.50 to A.G.A. members; $5.00 to non-members.

This is a complete new handbook on light oils and light oil products prepared under the direction of the A.G.A. Gas Chemists' Handbook Revision Committee, E. L. Sweeney, Chairman.

Today there is an enormous demand for benzene, toluene, xylene, solvent naphtha and other light oil products. Notwithstanding their importance in very many phases of the war effort, it has up to now been difficult to find a comprehensive and up-to-the-minute book of standards devoted to this subject. This need has now been filled.

The book covers the subject from the angle of chemical and physical tests and specifications. Its contents include: Standard specifications for various light oil products, such as benzene, toluene, etc.; definitions of terms relating to light oils and light oil products, such as odor, acid wash color test, specific gravity, etc.; standard methods for sampling light oils and light oil products and detection and removal of separated water; standard methods of test for the various qualities of light oil and light oil products; and short methods for sampling and testing. Finally, there is an appendix which contains valuable chemical tables as well as miscellaneous information, such as U. S. Army and Navy specifications.

The format is similar to that used by the A.S.T.M. in its specifications.

Design of Post-War Gas Appliance Contest

Design of post-war gas appliances received some serious thought by Portland (Ore.) Gas & Coke Company employes as a result of an idea contest sponsored by the utility in May, according to C. W. Steele, residential manager and contest director.

Seventy-four entries were received and prizes totalling $120 in war bonds and stamps were awarded, Steele reported. All of the entries, after local judging, were forwarded to the Pacific Coast Gas Association, sponsor of a contest after which the Company contest was patterned. Winners in the Company contest were as follows:

Dorothy Johnson won first prize of a $25 war bond in the women's section of the contest. Second and third prizes of $10 and $5 in war stamps went to Mrs. Gladys Hooge and Volenta Knowlton, respectively.

An identical set of prizes for the appliance service department went to Robertson Cook, Fred LaMear and Arthur Lembach in the order named. The third set of prizes for the home service and residential department went to Mrs. Eunice Doane, O. A. Stevenson and Mrs. Rita Calhoun, also in the order named.

War Production Board and Other Administration Orders

ALLOTMENTS FOR MINIMUM PRODUCTION QUANTITIES

The following official interpretation is hereby issued with respect to § 3175.1 of CMP Regulation No. 1:

(a) Paragraph (o) (2) (iii) of CMP Regulation No. 1 permits a mannufacturer to exceed his authorized production schedule "where a delivery order calls for delivery, in successive months, of Class A products in quantities which are less than the minimum practicable production quantity, and compliance with monthly production schedules would result in substantial interruption of production and consequent interference with production to fill other delivery orders." In such a case the manufacturer may "produce (and his customer may order) in the first month, the minimum practicable quantity which may be made without such interference."

(b) A manufacturer is entitled to apply for (and his customer is entitled to make) an allotment during a single quarter of the quantity of controlled materials required to produce a minimum practicable production quantity even though the customer's requirements for the finished product may run over several quarters.

In illustration of the above, a customer's requirements of screw machine parts for the third and fourth quarters of 1943 constitutes a minimum practicable production quantity. The manufacturer of the screw machine parts may apply for an allotment for the third quarter of 1943 of all of the controlled materials required to produce the parts. The customer should include the quantity in his application for an allotment and if an allotment is made to him, he should make a third quarter allotment to the screw machine manufacturer for the entire quantity, and should charge the total quantity so allotted to his third quarter allotment account.

Issued this 11th day of June 1943.

Office of Defense Transportation

CONSERVATION OF MOTOR EQUIPMENT

SUBPART M—CERTIFICATES OF WAR NECESSITY FOR AND CONTROL OF COMMERCIAL MOTOR VEHICLES

Pursuant to Executive Orders 8989 and 9156, § 501.96 of General Order ODT 21, as amended (7 F.R. 7100, 9006, 9347, 10025, 8 F.R. 551, 2510, 7357), is hereby amended to read as follows:

§ 501.96 *Motor fuel and commercial motor vehicle parts, tires, or tubes.* No person shall transfer any motor fuel to, or transfer, mount, or install any part, tire or tube, in or upon any commercial motor vehicle, unless the operator thereof at the time of such transfer or installation, shall present to such person for inspection a valid Certificate of War Necessity pertaining to such vehicle, issued by the Office of Defense Transportation: *Provided*, That the provisions of this section shall not apply to transfers or installations made pursuant to a coupon, certificate, or other instrument, authorized or issued by a rationing agency of the United States, or to the sale, transfer, or delivery of motor fuel, parts, tires, or tubes, to any person for the purpose of resale.

This amendment shall become effective June 10, 1943.

Dr. Hainsworth of Servel Inc. is Chairman Industrial Research Inst.

Dr. William R. Hainsworth, vice president in charge of engineering and research, Servel, Inc., Evansville, Ind., has been named chairman of the Industrial Research Institute. The Institute is made up of research executives representative of various types of industrial firms and industrial areas, organized for the purpose of cooperative study of their common problems.

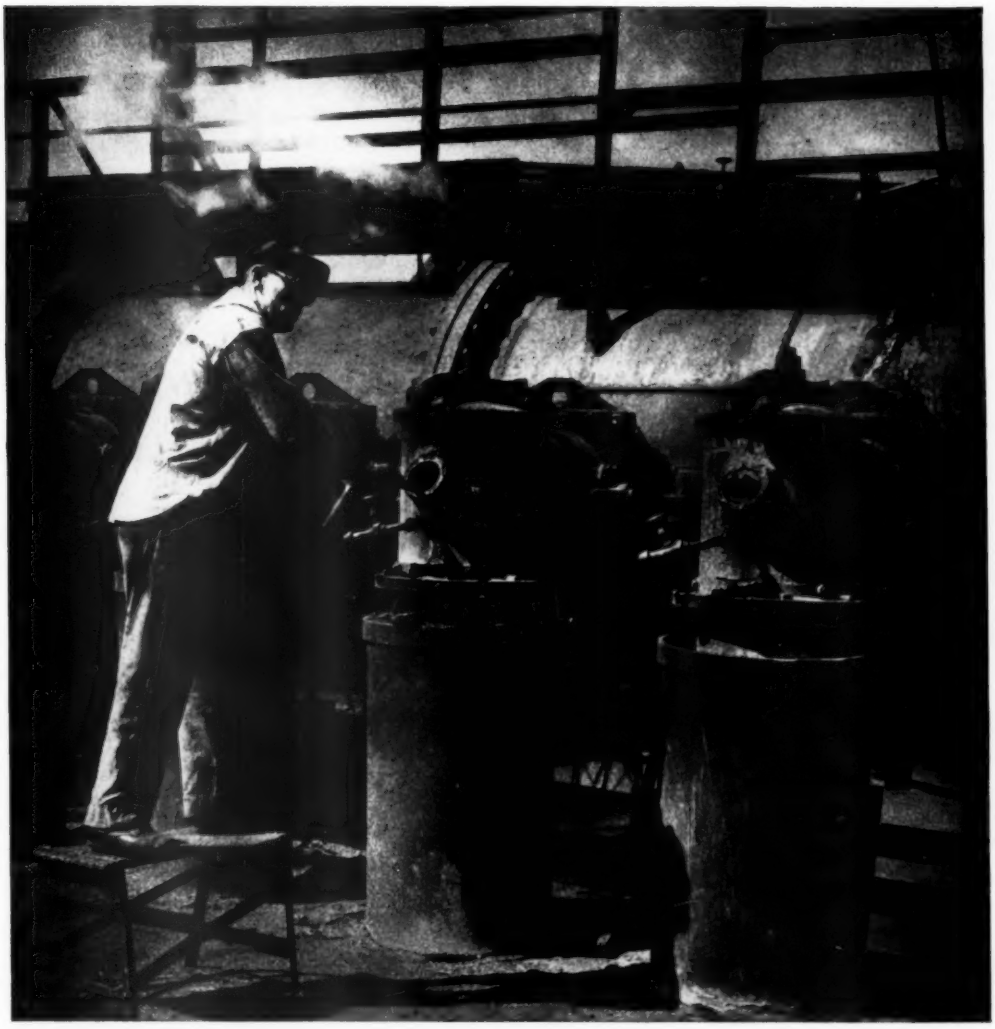
The appointment of Dr. Hainsworth was made by the executive committee of the Institute. Dr. Hainsworth succeeds H. S. Benson, administrative engineer of the research division, United Shoe Machinery Co., Beverly, Mass. Dr. Lincoln T. Work, director of research and development, Metal and Thermit Corporation, Rahway, N. J., was named vice chairman of the Institute.

Dr. Hainsworth is a nationally known refrigeration engineer. He has been associated with Servel, Inc., since 1926, the year that company first manufactured gas refrigerators. Prior to that, he was head of the research department of the National Automatic Refrigerator Co. He also served as refrigeration engineer in charge of research of the National Refrigerator Co. He is a former president of the American Society of Refrigerating Engineers.

McCormack Joins Fox Munitions Corpn.

Denis McCormack, who for the past 11 years has been Manager of the Commercial Instruments & Controls and of the Flight Instruments Departments of Julien P. Friez & Sons, Division of Bendix Aviation Corporation, Baltimore, is leaving the service of that company the first of July to take up a more responsible appointment as General Manager of the Fox Munitions Corporation, Philadelphia, Pa.

Mr. McCormack is known as an authority on humidity measurement and control and was responsible for the formation of the Departments referred to above. The resulting Friez products have earned an international reputation as indoor weather instruments of equal standing with the famous Friez outdoor weather instruments.



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